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San Francisco, Calif.

July 15, 1926
25 Cents

Journal of Electricity

Devoted to the Economic Production and Commercial Application of Electricity
IN THE ELEVEN WESTERN STATES

THE SATURDAY EVENING POST
now
more than
150,000
Frigidaires
An analysis of Frigidaire value, from the standpoint of construction, finish, capacity, dependability, economy and service, reveals at once the reasons why the Delco-Light Company is the world's largest builder of electric refrigerators.
THE SATURDAY EVENING POST
now
two
hundred
thousand
Frigidaires
are providing the convenience and economy of electric refrigeration to the homes and stores of America. A careful analysis of Frigidaire value, from the standpoint of construction, finish, capacity, efficiency and economy, reveals at once the reasons why Delco-Light Company, subsidiary of General Motors Corporation, is the world's largest builder of electric refrigerators.

May 8th 150,000 -

July 3rd 200,000

THE May 8th issue of the Saturday Evening Post announced that there were then more than 150,000 users of Frigidaire Electric Refrigeration.

The July 3rd issue of The Saturday Evening Post carries the announcement "Now two hundred thousand Frigidaires."

An increase of 50,000 in only two months.

We repeat now what we said then—that the enormous growth in Frigidaire sales constitutes the best proof that "the public Utility's greatest opportunity for profit in the field of electric refrigeration will be found in the Frigidaire franchise."

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DELCO-LIGHT COMPANY, Public Utilities Division
285 Madison Avenue, NEW YORK CITY

Frigidaire
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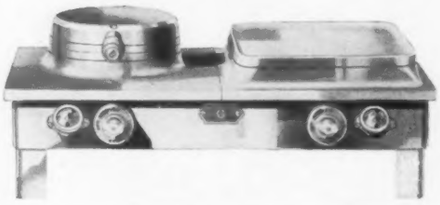
Why These and Other Leading Manufacturers Use Chromalox Heating Units Exclusively

CHROMALOX

The Griswold Manufacturing Company of Erie, Pennsylvania

Use Chromalox Units Exclusively Because—

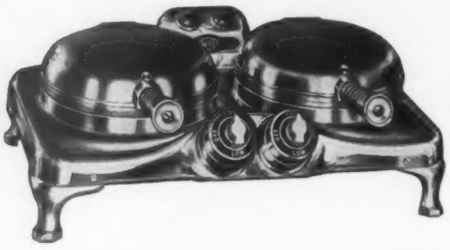


Chromalox units have broken every record for operation under the most severe conditions.

Result: Heating units that outwear all others—no replacements. Operation that completely satisfies everyone concerned—maker, jobber, retailer and customer.

The Wells Manufacturing Co., of San Francisco, California

Use Chromalox Units Exclusively Because—



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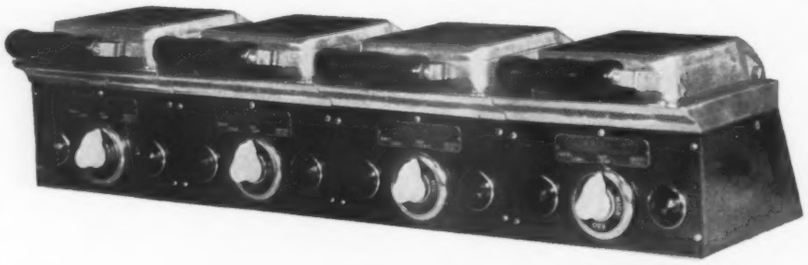
The Gloekler Manufacturing Company of Erie, Pennsylvania

Use Chromalox Units Exclusively Because—



Chromalox units have broken every record for operation under the most severe conditions.

Result: Heating units that outwear all others—no replacements. Operation that completely satisfies everyone concerned—maker, jobber, retailer and customer.

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ONCE in a while the editors receive a letter from a reader either commending some item in accord with the reader's views or else pointing to some inadvertent error. The following letter, except that the Journal was right and that the truck DID set at such an angle, is an example of both in one. And its last sentence has brought the satisfaction that through its columns the Journal may perform a service to those engaged in the industry, although they be in Buenos Aires. The letter is as follows:

Buenos Aires, April 29, de 1926.

Journal of Electricity,

Dear Sirs: I enclose clipping from your issue of Feb. 15, 1926, which shows very clearly that your editor is not a botanist or he would have noticed the direction in which the grass is growing. Also he is not a phytologist or he would have noticed the water bag is not standing vertically and keg of nails should not stand on the angle shown.

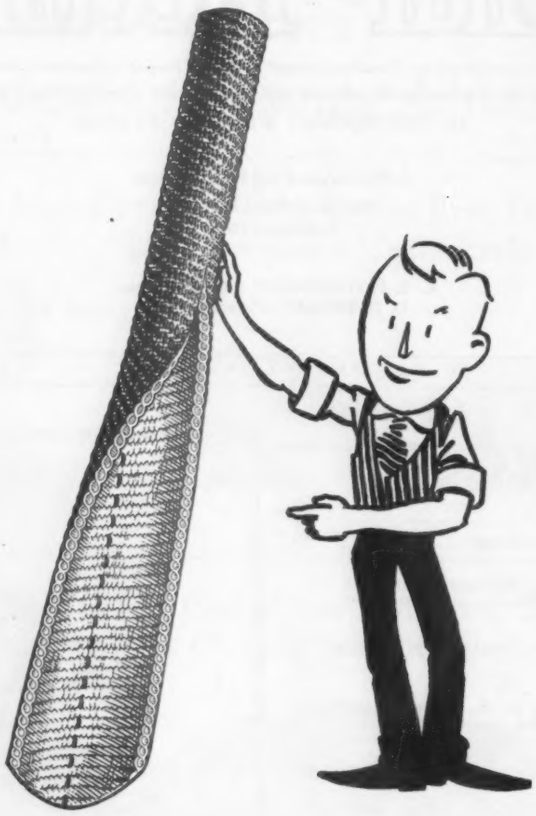
It is a pretty picture, however, and I like to see that somebody is smart enough to put something over on you.

In order to soften the blow, I am pleased to tell you that I get a great deal of satisfaction from your journal besides the mere money we make out of connections secured from reading your advertisements. The profits of one transaction which resulted from your advertisements would pay our subscription well into the twenty-second century.

Yours very truly,

NEW YORK STEEL EXCHANGE, INC.

MARK R. LAMB,
Presidente.



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EDITORIAL

The Edison 100,000 Mark Is Reached

CULMINATION of a remarkable customer-ownership campaign to secure 100,000 stockholders for the Southern California Edison Company was brought about recently when the one hundred thousandth shareholding was sold to a lad of eight years. The facts that the one hundred thousandth stockholder was a boy and that the goal had been reached were interesting sidelights only of the truly important fact that the Edison company had reached its goal through the efforts of its own organization, its officials, its employees, and, more important, its previous stockholder-owners, none other than its customers.

One of the first companies to extend its ownership to its customers, and always a company which gave to all of its shareholders, both of common and preferred stock, full voting privileges, the Edison company now has added to its distinguished record the first achievement of 100,000 owners.

Of the more signal features of the campaign is the fact that nearly 30,000 of the new stockholders were added in this campaign. On May 15, 1925, at the beginning of the campaign, the Southern California Edison Company numbered its stockholders at 71,300. By September there were 80,000, and, as the year closed, the number was growing into 90,000. The remaining 10,000 shareholders were obtained during the past few months, culminating gloriously the campaign begun a year ago, sponsored by "The 100,000 Club" of Edison employees.

The Edison company ownership will stand as one of the most convincing and irrefutable arguments that the utilities of California are publicly owned through the one true and responsible ownership of the public as individuals, under public regulation and sane business administration.

Introducing an Old Friend to Mr. California Voter

SUFFICIENT signatures have been obtained to place the justly famous (and, we might add, iniquitous) five-hundred-million-dollar California Water and Power Act on the November ballot in that state for the third successive time. Figures recently issued by the Secretary of State show that a total of 82,318 voters signed initiative petitions at the behest of solicitors who not only received an average of ten cents for each signature secured but also employed devious methods of misrepresentation to secure these names.

While the perseverance of the sponsors of this proposed constitutional amendment in placing this measure before the public in the face of two overwhelming defeats is to be marveled at, the scheme of government which allows such a procedure is to be deplored. The proponents of the initiative and referendum amendment to the California constitution, as in other states, secured its approval on the basis that it was a much needed reform through which popular government would be assured. The experience to date with the Water and Power Act effectively shows up the many weaknesses of this governmental procedure. Despite the fact that this act has been twice defeated by a majority of more than two to one with an even greater majority against it in 1924 than in 1922, this year the taxpayers will be put to the expense of carrying the measure to the electorate for a third time simply because a group of political theorists possessed sufficient funds to employ solicitors, who in turn influenced the necessary 77,263 voters to affix signatures to the initiative petitions. Thus 77,263 voters are able to thwart the expressed will of the 751,885 voters who in 1924 declared that a socialistic program such as that proposed by the act had no place in California. It is obvious that the initiative, rather than giving expression to the will of the majority, affords to the minority an opportunity to take an active part in government.

Since there is no correction for this system, at least at present, it would seem that both the voters and business will continue to be harassed with Water and Power Acts and other similar iniquitous legislation for years to come, or until such time as the initiative is eliminated from the process of government.

Public Relations from the Standpoint of Public Regulation

IN adding a valuable contribution to the public relations literature of the electric utilities, Lester S. Ready, chief engineer of the California Railroad Commission, has made some criticisms of a highly constructive nature. His address before the recent convention of the Pacific Coast Electrical Association, excerpts from which are presented on another page of this issue, emphasizes a side of the public-relations question to which too little attention has been given.

To make his point that there is a definite relationship between good public relations and successful regulation, Mr. Ready may have trodden rough-shod upon the toes of certain individuals. These men may glean a certain measure of satisfaction from the fact that they are not the only ones who have transgressed. Only by being frank and sincere could Mr. Ready make his message plain.

One or two of his statements are worthy of repetition purely from the standpoint of emphasis. In discussing the tendency of utilities to make an alibi of the commission he says, "The Railroad Commission will take the responsibility for its acts of regulation. Be sure you take your responsibility for your acts of management." Such a straightforward statement requires no explanation. Speaking of rewards for efficiency, a subject which is demanding more and more attention, he states, "It is becoming realized that public regulation cannot assure a continuing return even with efficiency of operation, nor can it grant rewards for special and outstanding efficiency to a company which does not have the confidence of the public it serves. When you believe you are entitled to reward for efficiency, be certain that the public-relations department of your company has been as efficient and effective as you believe your construction and operating departments have been and that your company has the good will of the public it serves."

Coming from an unbiased yet highly interested source, such statements are doubly valuable to the industry. No opportunities should be overlooked to have either Mr. Ready or speakers of his type address meetings of the industry at more frequent intervals.

Misstatements Which Must Not Be Overlooked

LACK of definite information has led to a number of popular misstatements regarding electricity in the combating of which the industry has been entirely too lax. It is common to hear a layman say, "Electric rates are too high." When asked if he knows what the rates are, this member of the public invariably will answer, "I don't know, but they are too high." This man should be shown immediately that rates are lower on the Pacific Coast than in any other section of the United States, on an average, lower than any other place in the world.

Another layman may be heard to pronounce, "It costs too much to cook with electricity." In nearly every case questioning will show that electricity is not used for cooking in his home. He should be told that records show that the average monthly cost of cooking with an electric range varies between $3 and $5 per month, according to the size of the family.

When the remark is made that "Electric heat costs too much," find out what the present fuel bill in that man's home is. He will not be able to tell you. If he does not know what his own fuel costs are, how can he say that heating with electricity is too expensive? Electric heat, properly applied and used, is economical.

Perhaps the layman will state that under government ownership rates are lower and service better. This statement should be disproved immediately. Every man or woman in the electrical industry should be capable of combating such an argument as this. Average rates are not cheaper and service is not better, without mentioning any of the many disadvantages which accrue with government ownership.

Statements such as the above are heard every day—on the streets, in clubs, in street cars, wherever groups gather and converse. It is to the advantage of every member of the electrical industry to see that those statements are answered immediately, for by repetition they soon will become accepted facts.

The New Republic Tries to Steal a Ride

POWER has been discovered by the New Republic. Its intelligent young men, bent upon remaking the world according to Omar Khayyam pattern, namely: "break it into little bits and then, remould it nearer to the heart's desire," have decided to operate upon power, now that someone else has gone to all the nasty bother of inventing, designing, building and operating power systems. The really dirty work has been done, so it is meet that a little of the surplus of intelligence, hitherto sloshed liberally over birth control, Soviet Russia, Senator Brookhart, Gifford Pinchot, little theatres, psychology and Dr. Freud, be laved over the subject of power. It looks as if power were going to be a going proposition. It is time to steal a ride on its bandwagon, and, if possible, throw a little intelligent dust upon the axles as it goes along.

With headline type in a recent number the New Republic announced an imposing list of names, each of whom was to give the great "truth" about power. Having cornered O. C. Merrill, secretary of the Federal Power Commission, for one article sanely stating the effectiveness of federal regulation in the Conowingo development, the magazine then surrounded him with a galaxy of writers whose qualifications for the job seemed to be based upon their lack of any previous intimate contact with electrical development. These men largely were college professors in economics, social workers, and employees of some of the numerous bureaus with which government now is so generously adorned.

Yet who the young gentlemen are is hardly in point. What they have to say is the criterion by which their presence in New Republic's "power" supplement may be best judged. Except for Judson King, one of the chief philanthropic economists and experts of the Townley scheme for an utopian North Dakota which failed to "utope" in the right places, the galaxy is composed of writers who as yet have their reputations to make.

The subject of power development and control of utilities is very cunningly introduced by means of a summary editorial, at the foot of which is a table. This table is an ingenious device. It appropriates a number of base figures on power production, population, capitalization, revenues and lighting rates for the years 1920 to 1925 from the Electrical World. From these it deduces that the cost of power now as compared with 1920, using the purchasing power of a dollar as a basis, is 21 per cent higher. This is a clever trick, and no doubt will be used to advantage by all advocates of government ownership quite liberally in the future.

If figures had been based on 1913 values, the

values existing in normal or pre-war times, the results would have shown what everyone in the electrical industry knows, namely, that electric costs are lower now than at that time. But by basing costs at the peak of war prices, 1920, when the purchasing power of the dollar was very low, costs of living high, and electric rates only slightly higher than at present, it is easy to show that the present rates are comparatively high with respect to a dollar that now buys more than it did in 1920. Because electric rates never rose very high even in peak-price times, these gentlemen feel that it is perfectly fair and honest to claim that they have not come down in comparison with living costs.

Among the articles themselves one finds much viewing with alarm of the growth of the industry and much concern over regulatory measures. One of the charming ideas put forth is that four strongholds of government ownership should be established to serve as **a model** for private power companies and to restrain them by competition. These fortresses are designated as located at Seattle, where municipal ownership already has floundered about considerably and cost increasingly more; at Los Angeles, where niceties of bookkeeping provide alluring "profits" (and Boulder Dam is to be thrown in gratis); at Muscle Shoals, where the government has been fiddling away money and time for eight years building a project which private enterprise might have had delivering power to the South for six of those eight years; and on the St. Lawrence, where Governor Smith of New York wants to play.

Much is made of the unequal conditions of regulation in the various states, but nothing is said of the efforts being made to unify and extend the powers of regulatory commissions to cover every possible phase of utility activity wherein abuse might exist. There is glib talk of "Giant Power," with its ideal large-scale development by some master mind, disposing easily, if not economically or actually, of the numerous by-products derivable from steam-plant operation, the sale of which, it is held, would provide power generated from fuel which costs nothing. There is easy-going talk of the projects that could be cheaply financed, IF the taxpayers would guarantee the stipulated returns.

One writer is greatly concerned over holding companies, and yet he admits naively that the leaders of the industry themselves are concerned with certain problems relative to holding-company operation. These men have issued warnings, too, but they have gone about to find ways to remedy them constructively. The industry may be relied upon, upon the record of its past, to heal its own wounds. Good business dictates that no unsound condition be allowed to exist lest it destroy the whole carefully built structure.

Another writer goes out of his way to devise curious interweavings of ownership. He charges the General Electric Company with ownership of stock in almost everything. He has not analyzed far enough to see that much of this ownership is held by that company's employees' investment company, and there is just as much sense in his accusation as there would be to say that the railroad locomotive engineers own almost all the industrial enterprises in the country because their brotherhood banks own stock in anything that is a sound investment.

The sideshow is provided, however, by Walter Durand, of the People's Legislative Service, and Judson King, who now disports as secretary of the National Popular Government League. Both indulge in the well known acts known as figure-juggling and slack-wire financing. How gloriously they throw about some of Ontario's choicest rates as compared with rates in Little Rock, East St. Louis, and Knoxville! Seattle's rates, too, are held up for public admiration, and nasty insinuations are made as to what robbers private utilities must be.

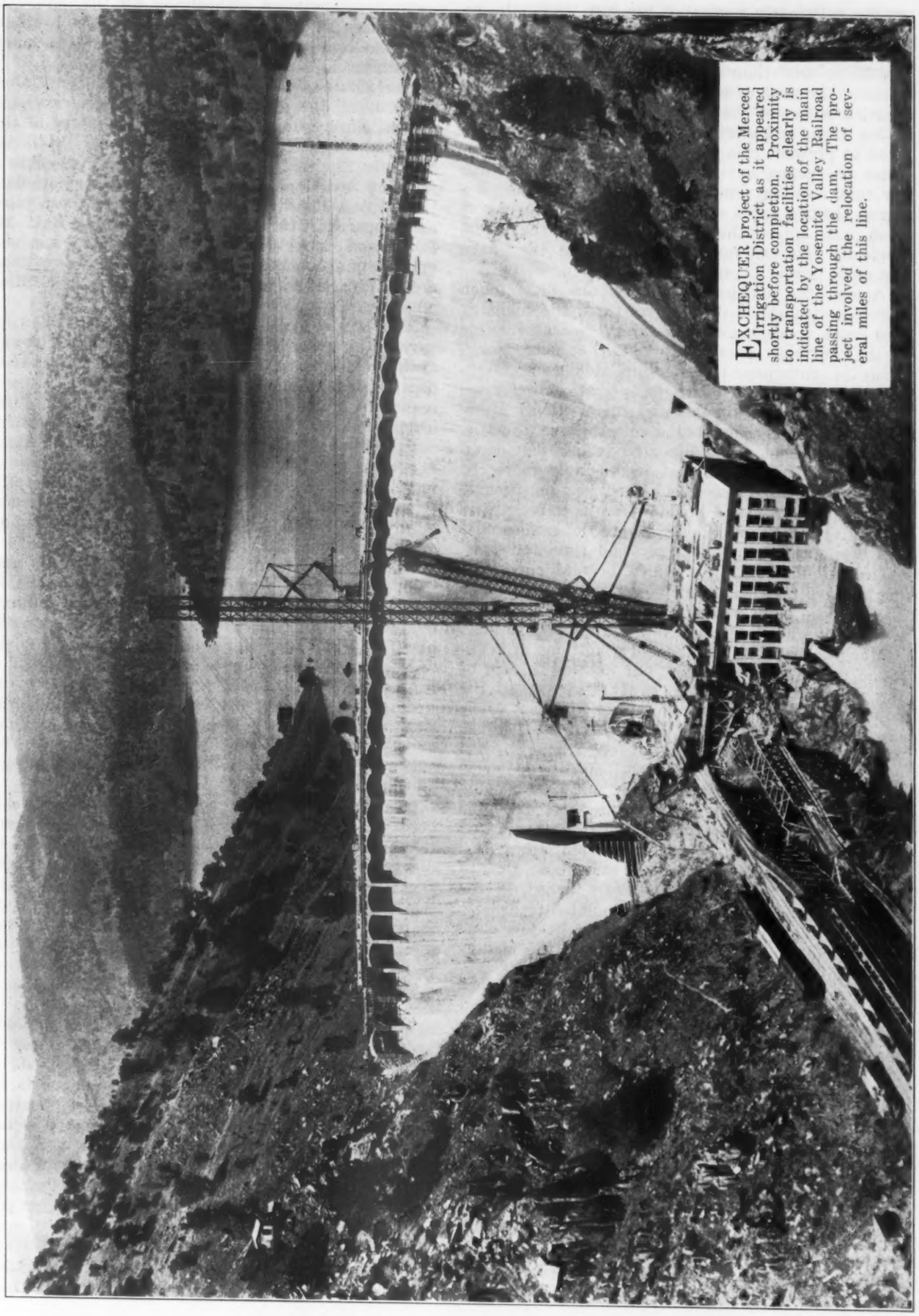
Mr. Durand gives it all away, however, when he says, "The cost of construction of a public power system is a matter of bookkeeping." He infers that because distribution costs are high, "this is a strong reason for public experiment in distribution," overlooking the fact that the public, through its governmental agencies, never experiments in anything, much less lowers the cost of anything that provides more and more jobs for the faithful. Mr. Durand's remarks could be given the benefit of considerably more space than his "intelligence" upon public ownership would justify.

Intelligent criticism is helpful. Some of the material in the New Republic, be it said in justice, is criticism of this order. Yet the solution offered by the New Republic for the problems it succeeds in making of the power question is not only open to question—it has been tried and has been found a failure since government enterprise built the pyramids of Egypt. And the very governmental operation which the New Republic champions on one hand it denounces on the other. There is no organ today so loud in its outcry against politics and political chicanery.

Can the New Republic and its audience of intelligentsia consistently desire **more** governmental activity for politics to play with when it itself is so disgusted with politics that it says so in these words in another column:

"Fear of losing out in the political sweepstakes, distrust of their political foes and themselves, hunger for personal and sectional aggrandizement, satisfaction over any order which benefits them, no matter the hardships it works on large bodies of the electorate, unwillingness to bestir themselves in new or altered fields, subordination of the nation's needs to their own desires, worship of a cause or movement that might suffer from change, and a general forgetfulness of the ordinary demands of decency and justice—these are the petty factors which entered into the refusal to provide equal representation and make all honest men wish that Patrick Henry, too sparing of his adjectives, had based his defiance of an autocracy just as blind and stupid on the ground that 'taxation without **proper** representation is tyranny.'"

Thus was written the New Republic's own refutation of its contention that government be further extended to make power development a political toy.



EXCHEQUER project of the Merced Irrigation District as it appeared shortly before completion. Proximity to transportation facilities clearly is indicated by the location of the main line of the Yosemite Valley Railroad passing through the dam. The project involved the relocation of several miles of this line.

Public Relations Under Public Regulation

By Lester S. Ready*

Chief Engineer, California Railroad Commission, San Francisco

IF frank, sincere, constructive criticism is good for the soul, then Mr. Ready's comments on the definite relationship between public relations and regulation should have a beneficial effect upon the utilities. Standing as he does between the utility and the public, he has been afforded an opportunity to observe much that has escaped the attention of utility men and in this article he presents his views on a highly important subject.

PUBLIC relations has been the subject of much discussion at conventions of public utilities throughout the country for a number of years. Each year sees the subject given more serious consideration. The apparent lack of public confidence or public good will has given many of the utilities serious concern with the result that in most of the progressive utilities of today special departments have been created to consider ways of improving public relations. It is well that this has been done, for it is apparent from a study of the whole question of public-utility operations that public confidence and good will are as important to the continued success of a regulated public utility as of private commercial enterprises.

Believing, as I do, in the importance to public utilities of retaining the good will of the public and its importance also in the scheme of sound regulation, I feel that possibly the presentation of an analysis of the problem by one connected with regulation may be of benefit in the better service of the public.

Much progress in the development of good public relations, on the part of the utilities, has been made. In many places the utilities have made a business of improving public confidence and public good will. The public has been informed and has gained a better appreciation of the utilities. The utility men have gained a better appreciation of the desires, wants and rights of consumers and the public in general. Much progress has been made, but the opportunities and responsibilties for advancement in this field are still great. It is no time to be self-satisfied. In some quarters a full appreciation of the value to the utilities of better relations is thoroughly understood. On the other hand, one is surprised at times to see the lack of sincere and honest application of the principles involved; half truths still are put out, misinformation presented to the public and to the commissions, sharp practices indulged in, with the result that a distrust on the part of the utility consumers continues.

Utilities have had a problem to contend with in creating and retaining public confidence. Unfortunately, due to the acts of some utilities, the reputations of utilities in general were besmirched by the phrase "The public be damned." I am certain that many utilities did not and do not justify this, and yet there must have been considerable justification for it or otherwise it would not have been so hard to live down.

Unfortunately, during the early stages of public-utility regulation, a number of utility men so resented public regulation, considered it so unjust and such an infringement on their rights that they intentionally or unintentionally took it out on their consumers. Many cases came to my attention in the early days of effective regulation in California where utility employees, and sometimes executives, treated those who brought complaints to the commission in a most unfortunate way and misapplied rules promulgated for the general benefit of the public to discredit regulation. These acts did not help to overcome the prejudice of the public, and in many cases brought serious trouble upon the utilities involved.

The existence of numerous complaints regarding rates, the serious opposition to justified rate increases, together with the threat of public ownership of public-utility properties brought out clearly the absolute necessity that public utilities have the fullest public confidence and good will if their profitable existence in public service was to continue.

The public utilities are probably the most extensive retail-credit enterprises that we have. The nine largest electric utilities in California serve 1,100,000 consumers. Of this total, approximately 900,000 are residential lighting consumers, whose average bill is less than $2 per month per consumer. The service is rendered on a monthly credit basis. How many retail dry goods stores handling credit accounts do or could do business on an average monthly bill of less than $2? The service rendered is a necessity. The dealings are primarily with individuals. The use of the public streets brings the utilities in direct contact with those elected to represent the public politically. On every side and in practically every phase of its activities the public utility comes in direct contact with the public, individually, in groups, and politically. It is, therefore, axiomatic that the utility must obtain and retain the public confidence and good will.

The public utility is, of necessity, not a temporary enterprise. Every dollar of annual gross revenue

* Excerpts from an address before the Public Relations Section, Pacific Coast Electrical Association, Los Angeles, June 11, 1926.

requires a capital investment of from $4 to $5. Rates are not made to amortize the investment; the public necessity demands a service continuing into the future. Once in the business, there is no way out for the business. The owners may get out by sale or be forced out by condemnation. The obligation to expand demands the continual addition of capital. The success of the utility, therefore, depends upon the continuing profits that it may make in rendering the service that it supplies. Lasting public good will will aid the obtaining of continuing return.

The monopolistic nature of the public utility demands a higher standard of courteous service and it calls for greater public good will than the competitive enterprise. As part of the public, we can stand some incivilities on the part of a storekeeper if we can trade somewhere else should we desire, but we balk at the same treatment when that option is taken away. "To have to" goes against our American makeup. Because the utility is primarily a monopoly, it has to contend with the suspicion that exists in most of us that excess profits go with monopolies. For these reasons a high standard of service, a high standard of ethics and a high standard of treatment under the conditions of privately owned monopoly are required.

Good Public Relations Essential

Good public relations is essential to publicly regulated utilities. May I quote from the report of Franklin Griffith in an address before a recent meeting at Seattle? He stated in part:

"In this industry we are goinng ahead steadily by tremendous leaps and, if we progress as we should, we must not lose sight of the fact that our growth, our success, depends, even to a greater degree than on the efficiency technical men may bring into our affairs, upon that most powerful thing, the good will and confidence of the people."

Good public relations represents the good-will value of the utilities; continuing return is assured and more prompt relief is obtained when rates must be increased, and complaints for reduction of rates do not occur or are delayed. The nullifying of all of the efforts for efficiency and economy which are carried out by technical and operating men has frequently occurred. At this point, I wish to speak a word of commendation of the efforts of technical and operating men. They have rendered and are rendering a great service to the utilities and to the public. Their conscientious endeavors in the several companies and in their technical committees, if better known by the public, would instill confidence. No company is acting in good faith to its technical and operating men that does not gain and retain the good will of its customers.

An instance of the cost of bad public relations comes to mind in the case of a manager of a utility division whose division had a record for efficiency and economy. He was loyal to the company until he was actually hurtful to its interests. He eliminated the niceties of public relations to save money. He was so loyal to the organization that he resented any criticism of it; he took issue and would argue with any consumer who questioned the correctness of estimates of the cost of extensions or statements submitted. His organization reflected somewhat the same attitude. What happened? Complaints were filed attacking rates; not because they were burdensome but because of the resentment of the public to the treatment received.

An instance showing the effect of good public relations also comes to mind. One company during the war period had applied twice for increases in rates. Its public relations was good. The applications asked for reasonable and justified increases. There were no protestants appearing at the hearings. An analysis and study by the commission was not delayed by long public hearings and the justified increase was obtained without delay.

Examples of Unsatisfactory Public Relations

Another company that was managed from a distant city had unsatisfactory public relations. The manager of the company was generally antagonistic to regulation and to criticism by the public. This attitude was reflected throughout the organization. At one hearing, with a court room packed with protestants (I believe mainly because of their treatment and not because of a pending increase in rates), he proceeded to call them down. An increase was necessary and legally justified. The commission granted the justified increases and subjected itself to considerable criticism by the public. The transfer of criticism to the commission did not reduce that against the company. Later the company's head office was transferred to the community served and a man who believed in fair treatment and confidence and honesty with his consumers was placed in charge. About a year later a further increase in rates was required. The city attorneys of the communities served came to the hearing and said in effect, "We do not know what the company is entitled to, but whatever the commission decides is fair will be acceptable to us." All the difference was due to the difference of public confidence.

There are certain utilities today operating at less than what might be classified as a fair return, which, I believe, could materially reduce their expenses—certainly their legal expenses—and materially improve their earnings if they would but be more considerate and more courteous. Good public relations hastens and makes more easy the doing of justice when increase in rates is necessary, and postpones complaints and even eliminates them. Bad public relations and poor service are more often a cause of rate complaints and the holding of companies to a limited return than are excessive rates.

The results of bad public relations, lack of confidence on the part of the public, though generally not as immediate in their effect upon the utility, are, in the ultimate, as serious as in a competitive enterprise. The fact that the detrimental results are often postponed tends to lull many into a lack of realization that they exist. The inability of the consumer to cease taking service, when ill treated, prevents the effect showing on the balance sheet of the company at once, yet the resentment of ill treatment develops and grows. It shows as vig-

orous protest to any increase in rates when found necessary and fosters and makes converts to public ownership.

The public confidence and good will essential to public utilities must be based on the strictest honesty, upon courtesy, including sincerity and consistency. High-pressure salesmanship fails in public-utility service because it is not lasting. The class of salesmanship that may work in enterprises of less permanency, or that are competitive, is often not applicable either. Unless a development of public confidence and good will is based upon the highest integrity it will fail in time. The utility will bear the loss when that time comes.

The sale of stock to customers has had a most beneficial effect, both in making the customer interested in the company and in bringing home to the utility men the necessity of consistency. As a result the former practice of shedding tears of despair at rate cases that changed into the radiant smile of hope and assurance as the stockholders and bondholders were met has had to be discarded. A more consistent and sincere statement of facts is being presented and tends to develop confidence. There still exists, however, on the part of bond and stock sales companies, a willingness to touch up the portrait that must some day be eliminated. The "customer-ownership of stock" has had as much of a beneficial effect on the utilities as it has had on the customers.

A few years ago there developed a tendency to stress to the public the great importance of the public-service corporations in the public welfare and development of the community; this, in some instances, went to the extreme of boastfulness. The utilities have reason to be proud of the part played, but many believe that if the very foundation of the prosperity of the community depends upon the utilities they should be owned by the public.

Reward for Efficiency

Some utility men have had the idea that under regulation nothing could be gained by efficiency or by better public relations; that the results of efficiency were or would be taken away from the companies and that good will was less important than legal rights. This has been a most unfortunate attitude, and it has been detrimental to good public relations. The problem of rewards for efficiency has been one seriously considered by regulatory men. Normal improvements in efficiency and development in the art are expected under the normal fair return. Failure to keep up with progress of developments will ultimately result in reduced returns. It is becoming realized that public regulation cannot assure a continuing return even with efficiency of operation nor can it grant rewards for special and outstanding efficiency to a company which does not have the confidence of the public it serves. When you believe you are entitled to reward for efficiency, be certain that the public relations department of your company has been as efficient and effective as you believe your construction and operating departments have been and that your company has the good will of the public it serves.

Inter-company cut-throat competition of the pre-regulatory type is not conducive to good public relations under regulation. Back-yard fights over business do not improve a utility's reputation for non-discrimination nor help the public's acceptance of regulated monopolies. Such practices are amusing though most unfortunate.

Trust and Confidence Required

It would seem to me that trust and confidence between utilities might aid in creating a greater trust in utilities by the public. When one sees two companies in contest as to rates or territory, one begins to doubt whether either should be trusted at all.

A practice existing among certain utilities that is regretable is the retention of inefficient and expensive plant or equipment which should be replaced or abandoned, in order to keep the higher capital in the rate base. Some instances of this may get by temporarily unnoticed by the commission and the public and the individuals who propose these schemes may consider themselves serving their companies, but as long as the companies do not "come clean," confidence cannot be expected. The sooner this practice is eliminated and the companies come forward with nothing to cover up, with no family skeletons, the sooner they may expect rewards for outstanding efficiency. The practice, if continued, may gain in a few instances, but on the whole it is not sound policy.

The problem of maintaining good public relations increases with the size of the utility. The electrical utilities have grown by consolidation and expansion until individual companies cover large portions of the state and serve many municipalities and districts. There has been a tendency to centralize control and operations until the local managers and local officers must refer many of their decisions to the head office. People like to deal with men who can say "Yes" and "No," not with a "I must refer it to the head office" type of man. Contralization of authority results in centralization of responsibility and encourages and fosters, in the parlance of the street, "passing the buck" by the local representative. Every local district should be a unit in itself, at least so far as the public is concerned. They must be the company to the people and be an integral part of the local community.

Making an Alibi of the Commission

There has been too great a tendency on the part of many utilities to make an alibi of the Railroad Commission. Too often, when it is not desired to do certain things, the consumer is advised, "The commission will not let us." The Railroad Commission will take the responsibility for its acts of regulation. Be sure you take your responsibility for your acts of management. "Passing the buck" to the commission may ease the way temporarily, but it detracts from the ultimate lasting public confidence necessary to a public utility.

If a utility wants justice done promptly and

continuously, public good will and confidence is a great aid in obtaining the same. Much can be done in the preparation for and presentation of proceedings to make it easier to do justice. If a utility finds it necessary to obtain a greater revenue through an increase in rates, good public relations will reduce the objection from its consumers and speed up the proceedings. Bad public relations results in long proceedings and ultimate dissatisfaction on the part of the public. The utility should first know in its own mind what it is entitled to and, considering all phases of the matter, what it can and should have. Then, if it asks for what it is justly entitled to and should and can reasonably receive, it should inform the consumers frankly and clearly of its needs and its request. Based on what it is justly entitled to, it has nothing to hide or misrepresent. A clear, concise and friendly presentation of its needs and a specific statement of its request will aid greatly. The legal side must, of course, be kept in mind, but, dealing with such a great number of consumers, this side should be held in the background and every reasonable effort made to inform the public as well as the Railroad Commission of the facts; what is desired is an increase in return not a law suit with additional expense and public dissatisfaction. Refusal to give information encourages suspicion and distrust. Willingness to assist protestants in the determination of facts encourages confidence. In many cases a frank statement to its consumers of the facts involved and how the increase will affect the bills of each individual consumer is beneficial. It is true that it may bring criticism on the company and opposition prior to the hearings, but that criticism and that opposition give the company an opportunity to tell the facts, to inform the public and, if its request is just, the public confidence will be increased. When the proceeding is submitted, the company's consumers will have had an opportunity to present their case; they will have had an opportunity to inform themselves; they will have had an opportunity to adjudge the company and to think over and anticipate what may result. Putting the "soft pedal" on applications for rate increases, failure to make a definite request and failure to inform the public have been detrimental to public relations. Surprises in the form of rate increases are unpleasant to the individual consumer. A resentment arises because it is felt that it was "put over." This condition breeds suspicion of the utility and of the regulating commission and stirs up resentment against the public utility and regulation.

Many public utilities make the mistake either of not asking specifically for what they want, fearing the reaction of the public and so letting the commission take the shock, or making claim far in excess of what they know (and in many instances the public knows) can be obtained under economic conditions, regardless of the legal right of the company to the amount claimed. Where an impossible request is made, the reaction on the part of the public is apt to be either that the utility is insincere or is a super-Shylock. Regulation may get some credit in disallowing the increase and does, but even that credit is largely lost by that reaction that "no fool would grant the request anyhow."

Regulation Has Public Relations Problem

Regulation has its own public-relations problem to contend with. It is doubtful whether it can indefinitely continue unless public confidence is retained. The doing of a duty, often in opposition to the public sentiment and apparent public desire, is unpopular, and regulation has had its share of unpopularity, but the success of regulation in California to date—and I am certain it has succeeded to as great an extent if not more than in any other state in the Union—has mainly been on account of the continuing ideal of justice and honesty which has guided the members of the commission and has been the foundation of its acts. It has sincerely and conscientiously searched for the facts and endeavored to do justice.

If the utilities believe in the principles of effective regulation and desire to see it retained, they can aid greatly by creating better public relations between themselves and their customers. What breaks down confidence in public utilities will have its effect on confidence in regulation. And what breaks down confidence in regulation under the present scheme of things will break down the confidence in utilities. Continuing sound regulation must be based on confidence. Bad public relations between the utility and its consumers creates distrust, makes unpopular decisions required by the limits of law or for the continuation of service, and results in criticism of regulation and loss of confidence. If the utilities believe in sound public regulation, they will exert every effort to create and maintain the confidence of their customers in them and in regulation. If they are not believers in sound public-utility regulation but are guided only by the selfish interest of business, they cannot, under the present scheme of things, afford to create a lack of public confidence in either themselves or regulation.

A $5,000,000 Stock Issue That Cost Only 22 Cents a Share to Sell

THAT customer-ownership stock sales have reached the enviable position of public acceptance and, what is better, public demand, has been given further support in the recent experience of the Pacific Gas and Electric Company in disposing of its issue of $5,000,000 of 6 per cent preferred stock in seven weeks, and at a cost of only $11,196.86 or a little over 22 cents per share.

The ease with which the stock was sold, as well as many other interesting and significant aspects of the distribution of ownership of the issue, may be considered indicative of the eagerness of the public to become shareholders in public utilities under the customer-ownership privilege. The stock was placed on the market in the latter part of December, 1925, according to A. F. Hockenbeamer, second vice-president and treasurer, and was sold out before the middle of February, 1926. Practically the only expenses incurred in the dis-

posal of the stock were in advertising in local newspapers, the salaries of the sales staff, and printing. Of the $11,196 total cost of selling, $8,606 was spent for advertising, or 17.21 cents per share. The payroll of the sales staff was $1,952, or 3.91 cents per share, while the stationery and printing amounted to $637 or 1.27 cents per share.

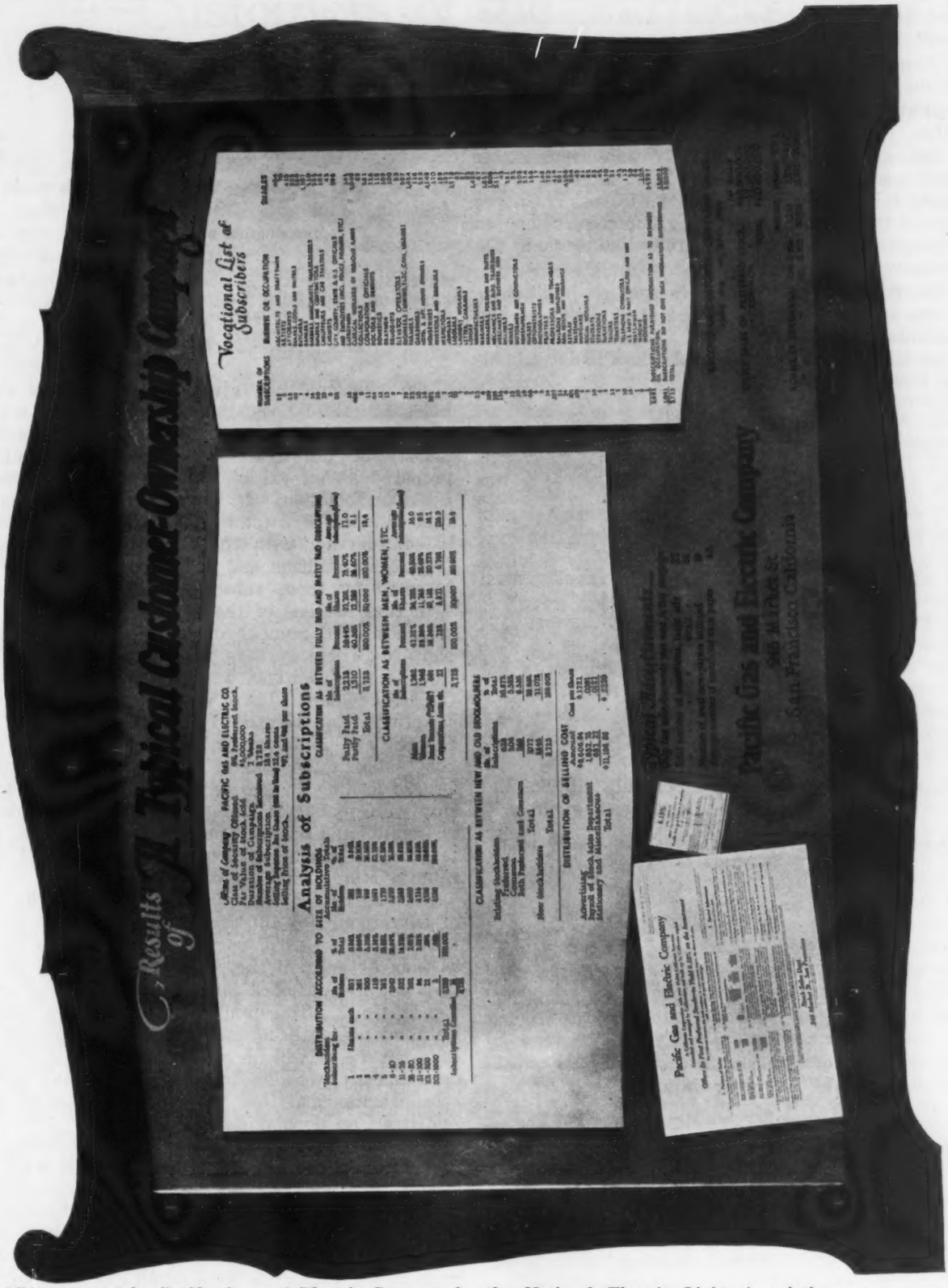

Results of A Typical Customer-Ownership Campaign
Vocational List of Subscribers
Analysis of Subscriptions
Pacific Gas and Electric Company
San Francisco, California

Exhibit prepared by Pacific Gas and Electric Company for the National Electric Light Association upon a recent customer-ownership stock sale campaign. Interesting figures as to distribution of stockholders, as to holdings of stock, vocations and other classifications are detailed. This campaign established a record-selling cost of but 22 cents per share.

Of the 3,723 subscriptions, 2,826, or 75.58 per cent were for 10 shares or less. The average subscription was for 13.4 shares.

Of the 50,000 shares purchased by the customers of the company, 75.4 per cent were paid in full, and 24.6 per cent were purchased on the installment plan.

Women bought 11,745 shares, or 23.49 per cent of the total, while 10,132, or 20.27 per cent were bought by "joint tenants," usually husband and wife.

Old stockholders made 1,077 subscriptions, or 28.93 per cent of the total. New subscribers for stock, however, amounted to 2,646, or 71.07 per cent of the total. The latter group were composed of people who had never before owned stock in the company.

The following tables show in further detail some of the unusual features of the stock holdings and classifications of stockholders. The first table gives in detail the number of stockholders listed according to the size of holdings:

Distribution According to Size of Holdings

Stockholders owning or subscribing for: share	Number of holders	Per cent of total	Accumulative Totals No. of holders	Per cent of total
1	357	9.54	357	9.54
2	361	9.66	718	19.20
3	200	5.35	918	24.55
4	119	3.18	1,037	27.73
5	742	19.85	1,779	47.58
6 — 10	1,047	28.00	2,826	75.58
11 — 25	532	14.23	3,358	89.81
26 — 50	262	7.01	3,620	96.82
51 — 100	94	2.51	3,714	99.33
101 — 200	18	.48	3,732	99.81
201 — 500	4	.11	3,736	99.92
501 — 1,000	3	.08	3.739	100.00
Total	3,739	100.00		
Subscriptions cancelled	16			
	3,723			

In regard to payment for stock subscriptions the following interesting figures have been given.

Classification as Between Fully Paid and Partly Paid Subscriptions

	No. of subscriptions	Per cent	No. of shares	Per cent	Average subscriptions (shares)
Fully paid	2,213	59.44	37,702	75.40	17.0
Partly paid	1,510	40.56	12,298	24.60	8.1
Total	3,723	100.00	50,000	100.00	13.4

Distribution of stock as to the sex of the stockholders gives the following data:

Classification as Between Men, Women, Etc.

	No. of subscriptions	Per cent	No. of shares	Per cent	Average subscriptions (shares)
Men	1,762	47.32	24,752	49.50	14.0
Women	1,243	33.39	11,745	23.49	9.5
Joint Tenants	691	18.56	10,132	20.27	14.7
Corporations, Associations, etc.	27	.73	3,371	6.74	124.9
Total	3,723	100.00	50,000	100.00	13.4

The large percentage of new subscribers for stock as compared to old stockholders subscribing is shown below:

Classification as Between New and Old Stockholders

	Number of subscriptions	Per cent of total
Existing Stockholders:		
Preferred	628	16.87
Common	206	5.53
Both Preferred and Common	243	6.53
Total	1,077	28.93
New Stockholders	2,646	71.07
Total	3,723	100.00

The cost of selling the stock is given in the following table:

Distribution of Selling Cost

	Amount	Cost per share
Advertising	$8,606.84	$ .1721
Payroll of Stock Sales Dept.	1,952.75	.0391
Stationery and Miscellaneous	637.27	.0127
Total	$11,196.86	$ .2239

An additional list, giving the number of stockholders listed by vocations in which they are engaged, provided an interesting feature of the large display of the figures concerning the campaign prepared as an exhibit for the National Electric Light Association. In it reports as to the vocation of 2,682 of a total of 3,723 stockholders were listed, together with the number of subscriptions from each vocation and the amount of shares represented by those subscriptions.

In that list one of the unique features was presented in the number of housewives subscribing. Next to clerical workers, representing 456 subscriptions, the housewives were the most numerous of the stockholders. There were 392 housewives' subscriptions, representing 4,149 shares of stock. Mechanics and building tradesmen came next, with 205 subscriptions and 1,806 shares of stock. Others leading in subscriptions and share ownership were managers, foremen and superintendents, merchants and business men, retired salesmen, professors and teachers, laborers, engineers and city, county, state and U.S. officials.

Nothing extraordinary was prepared in the way of advertising for the campaign. Only two advertisements were used, one large and another small, as may be seen in the display. The large advertisement was inserted but 27 times and the small one 58 times. The number of newspapers utilized was only 19, with an average of 4.5 insertions for each paper. It will be seen from this that printed salesmanship was no more required than actual salesmanship, and that the stock issue practically sold itself on popular demand.

The exhibit prepared by Mr. Hockenbeamer for the N.E.L.A. was mounted upon a panel 6 x 4 ft. in size. A frame of California redwood surrounded the lists and charts prepared. A photograph of the exhibit may be seen reproduced upon another page. By means of the exhibit the salient features of the campaign were admirably summarized and presented. The charts told the story almost at a glance.

Making Good Friends and Better Customers of the Farmers

By George C. Sawyer

Sales Manager, Pacific Power & Light Company, Portland

REALIZING that the farmers represent a particular class needing specialized treatment in the problem of customer relations, the Pacific Power & Light Company has instituted an unique service. It is explained in this article by the man that fathered the idea and put it into operation.

THE question of how best to establish and maintain a relationship with rural customers as close and as satisfactory as that existing with urban customers always has been more or less of a perplexing problem with the Pacific Power & Light Company. Serving, as it does, a large number of farms, farmers' tenant houses, and small rural groups scattered around each of the towns and cities served in Oregon, Washington and Idaho, the company always has felt that it suffered somewhat from that lack of understanding of its problems that comes from an absence of close acquaintanceship between the company personnel and the farmer customers.

Public Relations and Commercial Aspects

The management has been alive to this problem and has studied the situation intensively, with a sympathetic understanding of the farmer's point of view. This study revealed that in some quarters unfavorable conditions existed that might not have prevailed had the company been able to effect a mutual understanding with a large number of its rural customers, while in other quarters it revealed that a fertile field existed in which might be sown the seeds of agitation for radical legislation affecting utilities. A number of the usual and some unusual media had been employed in an attempt to bring about this understanding, and a reasonable degree of success had been attained, but it still was felt that further intensive cultivation of the farmer's interests would result in mutual advantage both to the company and the customer. One of the underlying thoughts in this connection was that a hidden enemy is more dangerous than an open one and that if the enemies could be sought out they could be either conciliated or guarded against. Thus it was determined to put into operation a sort of personal rural electric service, in which a man with a broad understanding of the utility business and thoroughly trained in the policies of the company would make friendly contact with all the rural customers and maintain this contact by frequent visits.

Logically coupled with the public-relations aspect of this service, is, of course, the commercial aspect. Although all campaign advertising in the country press and all direct-by-mail literature reaches all customers, nevertheless it was felt that sales did not attain sufficient volume among rural customers. Two main reasons for this are, perhaps, that it is difficult to solicit personally the scattered customers in the country, some of whom live twenty miles from the nearest company office, and that many such customers pay their bills by check and so have little occasion to visit company stores. The success of certain retail businesses that have tried carrying their goods to the customer by peddling along the roads led to the belief that this principle could be applied in a dignified way and included in the prime duties of the rural electric service man. Even though no great volume of appliance sales might result, it was seen that this function would furnish the entré for the service man to engage the customer in conversation which perhaps might unearth and clear up other and more weighty matters. Thus the service man carries with him a reasonably complete line of small appliances, repair parts, extra cords, plugs of various types, and lamps of all sizes, as well as a washing machine and a vacuum cleaner.

Transportation Equipment

The first detail to be worked out in putting the service into effect was the matter of transportation equipment. After some investigation a one-ton, panel-body truck was purchased and fitted up for carrying and displaying appliances. Special doors were cut in the side of the body, and, inside, a show case with shelves and back was built. Angle-iron uprights extending from the floor to the ceiling carry wire shelves similar to the shelves used in refrigerators. Small appliances are fastened securely on to these shelves by means of wire hooks secured by turning up thumb nuts against large washers on the underside of the shelf. The advantage of this type of shelving over wooden shelving is that the wire mesh does not accumulate dust and is easy to keep clean and neat. Furthermore it permits of changing the appliance display with a minimum of effort since the flexibility of the wire-hook fasteners is readily adaptable to appliances having bases of different shapes and sizes.

The background of the display case is of building board, attached to the angle-iron uprights. This is painted gray with a high gloss finish so that it

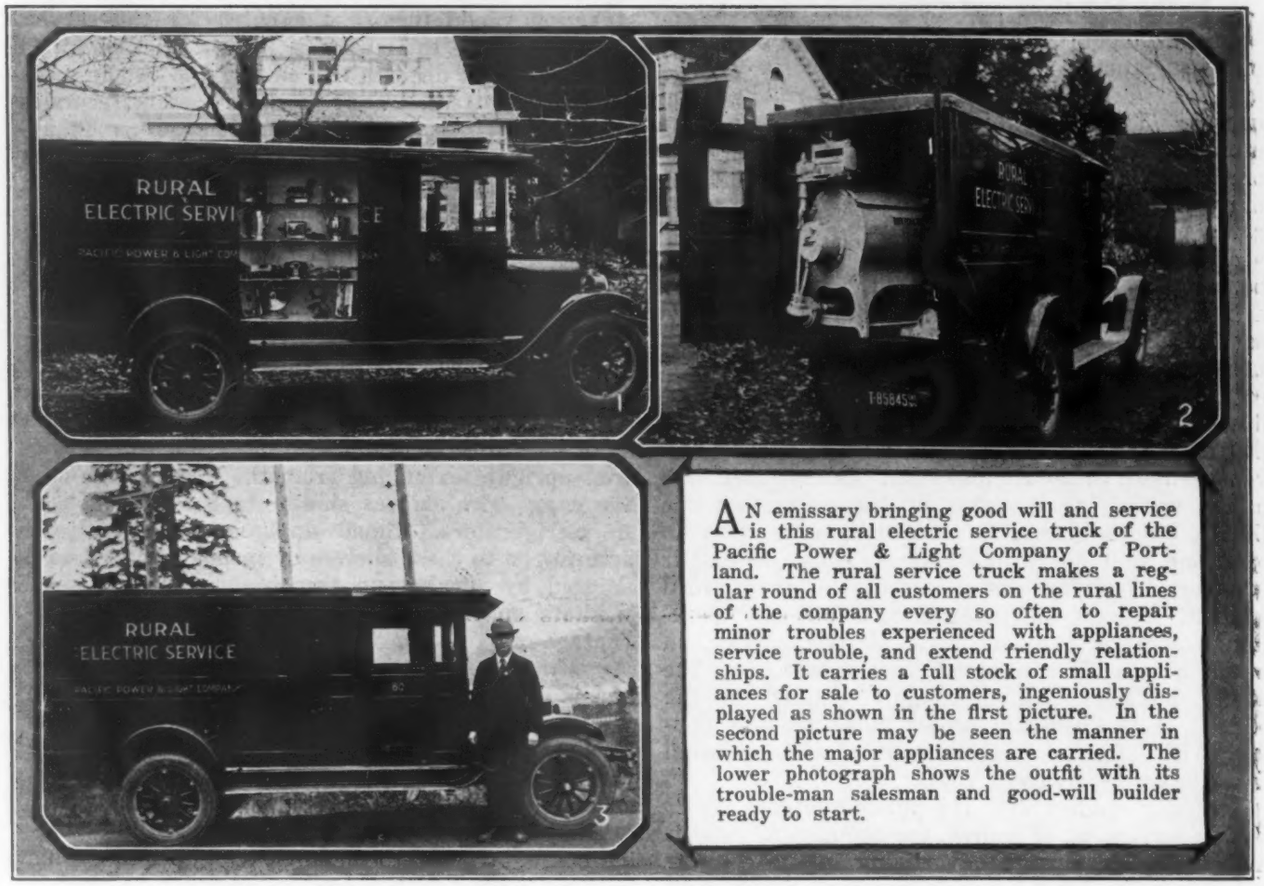
is easily dusted and kept clean. The side doors opening onto the display are designed to fold and slide in one direction only, swinging flat against one side of the opening, leaving only one-half of the outside of the door exposed to view. Thus the attractive setting of the display is unimpaired by any unfinished woodwork around the opening. Only the forward half of the body is utilized by the small appliance display, leaving the rear half, reached by rear doors, for a washing machine and vacuum cleaner or other larger device.

Duties of the Service Man

The service man's basic duty is to call periodically on all the rural customers in his district. He then must be prepared to discuss any subject pertaining either to company relations with the customer or to the utility business in general, whether it be concerning last month's bill or government ownership. He must of course be on the lookout to sell an appliance, or repair one that has gone out of service, or fill the empty lamp sockets, or give advice on wiring and on the application of motors to the farmer's needs for irrigation, stationary spraying and the like. In short, he is an all-around handy man in things electrical with a two-fold purpose. First, with a sympathetic understanding of farm problems, he takes the company's personal service to customers residing some distance from the ordinary center of company activities; secondly, he reaches a class of customers requiring specialized treatment, explaining some of the fundamental principles of the utility business in general and some of the necessary policies and practices of their own utility company in particular.

If the customer is interested in the larger matters discussed, he is given literature from the supply carried as part of the truck equipment. Such literature consists of the General Electric Farm Book, "Electricity in Oregon Agriculture," issued by the Oregon Committee on the Relation of Electricity to Agriculture, and available booklets on farm uses of electricity published by the experiment station of the state agricultural college. Other literature will be added to this list from time to time, and when an inimical political issue is before the people, such as was the Bone Bill in the state of Washington in 1924, the rural service man will prove to be an effective medium through which to present the utilities' side of the question to a scattered electorate difficult to reach by other means.

An important duty of the rural service man is to investigate and work up rural extensions. The man employed is thoroughly versed in the extension rules of the company and the state commissions, and is enough of an engineer to survey and lay out any extension to connect a group of prospective customers. He is capable of soliciting the prospective territory in an intensive way to secure as large an annual revenue as possible, and, after comparing the estimated revenue with the estimated cost, he is capable of explaining the necessity of customers' participation in the way of advanced revenue, if any. Thus his contact with such



AN emissary bringing good will and service is this rural electric service truck of the Pacific Power & Light Company of Portland. The rural service truck makes a regular round of all customers on the rural lines of the company every so often to repair minor troubles experienced with appliances, service trouble, and extend friendly relationships. It carries a full stock of small appliances for sale to customers, ingeniously displayed as shown in the first picture. In the second picture may be seen the manner in which the major appliances are carried. The lower photograph shows the outfit with its trouble-man salesman and good-will builder ready to start.

customers begins while they are still in the prospect class, and it is hoped that his handling of such situations will inspire such confidence among the customers that they will turn to him in every matter that comes up later affecting their relationship with the company.

Customers Are Classified

One of the important phases of the work is the card record kept of all calls made. The customer's interest in any appliance or electrically driven farm machinery is noted on these cards for use later as prospect lists to be followed up at the proper time. In addition to the appliance record, a notation is made as to the acreage farmed, character of the crops, the apparent relative prosperity of the farmer, and whether he owns or rents the farm. By means of a key system his attitude toward the company, whether friendly or otherwise, and his opinion on political ownership are catalogued. A tremendous amount of information is gained in this way that will be helpful in circularizing appliance and stock prospects, and in keeping track of customers whose attitude toward the company is favorable.

Close co-operation exists between this rural service and the county farm agents, state experiment stations and state committees on electricity and agriculture. The service man informs himself of what these agencies are doing, and in turn advises the farmer and assists him to secure the information he desires. The service man usually has found the local representatives of these agencies to be in sympathy with his work and ready to co-operate.

Immediate Returns Realized

After a few months' trial, results indicate that this rural service is making headway in bringing about a better understanding between the company and its farmer customers. In several instances misunderstandings have been cleared up, with the result that revenue has been added and a friend has been made of an enemy. Specifically, in one instance, the service man ran across a farmer who, due to a misunderstanding with the company some time prior, had discontinued using a 5-hp. motor and otherwise had curtailed his use of electric service. After hearing the customer's side of the case and explaining the company's in a frank discussion, the service man was able to take a new application for the discontinued power service to the complete satisfaction of the customer. Many minor difficulties over bills and whatnot have been explained or adjusted, and matters which otherwise never might have come to the attention of the company office because, perhaps, they were thought to be too trivial, have been arranged to the satisfaction of the customer, thereby keeping an ingrowing "grouch" from developing possibly into out and out antagonism.

Another favorable result of the service has been in the new rural business added through extensions. Several new customers have been connected on a basis satisfactory to the company. A number of these extensions were not live issues at the time the rural service man commenced his duties, and, since they were not being pressed by the prospects, it might have been a long time before they ever would have come to the attention of the office in the ordinary course of events. Thus during that time the company would not have had the revenue, and, what is perhaps more important, the farmers would not have had electric service.

The personal rural service first was put in operation in The Dalles-Hood River, Ore., district of the company. A second man with identical equipment, now has been established in the Yakima Valley, Wash., territory, and a third will be put into the Walla Walla, Wash., district as soon as the right man becomes available. This will cover the principal districts served by the company wherein are located most of the rural customers.

To sum up, the company felt that particular attention should be given to its farmer customers, and this personal rural electric service was the outgrowth of that feeling. The company is satisfied with results thus far attained and believes the returns will be cumulative.

Water Power and Steam Power in California Utilities

By H. A. Barre*

Executive Engineer, Southern California Edison Company, Los Angeles

THERE always has been more attendant publicity in connection with the development of water power than there has with the development of steam power. This widespread publicity, coupled with the existence of low rates and the almost universal use of electric service in California, apparently has given rise to the impression that water power has been the cause of these desirable results.

A brief analysis of the power situation to determine more clearly the respective contributions of water power and steam power to the existing conditions of the industry and their probable future effects may be of interest.

There can be no question that if no water power ever had been developed in the state there would

* Paper before Spring Meeting, American Society of Mechanical Engineers, San Francisco, June 28-July 1, 1926.

have been just as many kilowatt-hours sold annually as there are today. The use of electric power does not depend upon production but on market and distribution. Experiencing its most rapid development during a period when the advantages of electric-power supply from central stations had become well known, California supplied the market. Enterprising managements of electric utilities, recognizing the condition and aided by the rapid progress in the art of distribution, built the electric systems and by aggressive solicitation of business developed the market for practically a universal use of central-station electric power. That some part of the power supply came from water-power sources was incidental to the controlling factors of market existence and the presence of enterprising men willing to furnish the market with an electric-power supply.

Probably the most important contribution of water power to the industry is the fortunate fact that practically all the water powers are located at a distance from centers of utilization and that it was necessary to develop the art of transmission at higher and higher voltages to deliver the power to the towns. Shortly after the earlier of these water-power plants began to transmit electric energy to the towns, uses for power rapidly sprung up along the line in the outside country, and the amount of energy received by the towns from original sources of production began to decrease until the condiiton arose that at the season when water power was abundant some power was delivered to the towns, while during the season of low flow of the streams power generated from other sources flowed back from the larger cities to the country and the smaller towns.

The fluctuating character of the California streams also played a part in broadening the use of electric power, particularly in rural districts. Available water power occurs at its maximum during the rainy season and the early summer when the streams are filled from melting snow. In the late summer and fall low stream flows reduce the water-power supply. The heavy lighting loads occur during the early winter, usually before the streams begin to rise. Surplus water power in the early spring and summer, as well as the steam resources held for the winter peaks, made it possible to serve a summer irrigation-pumping load by the extension of the distribution system and with a minimum of generating plant.

The extension of country lines to serve irrigation-pump motors made possible further service of lighting and other domestic and industrial applications in outlying sections and still further broadened the field of use of electricity.

It is conceivable that with the improvements that have been made in the art of steam generation during the past fifteen years and with the comparatively low prices of fuel oil that have accompanied the development of the California oil fields in the same years, the cost of electric power in the cities perhaps could have been made as low as if served from the present systems of co-ordinated water powers and steam plants, but the extension of service to smaller communities and rural districts probably would have been slower in reaching its present density. In this connection it is interesting to note that those few companies in California which operate solely on steam power sell service at practically the same rates as those having water power, and have as high financial standing.

California water powers arrange themselves into two classes:

1. Those utilizing water storage during the dry season by means of either natural or artificial reservoirs.
2. Those using the unregulated natural flow of the streams.

The latter must be considered mainly as auxiliaries to a steam plant, since as a whole a steam installation of at least 75 per cent of their installed capacities is required to produce primary commercial power.

The former require small steam reserves and permit of highly efficient steam operation, since water deficiencies may be made up in kilowatt-hours by 24-hour operation of steam plants, while reservoir plants are available to carry peaks up to any predetermined draft on stored water.

Obviously, then, co-ordinated systems of steam and water power are needed for the maximum use of water resources. It is also apparent that a 100 per cent water-power supply is not desirable since this would mean that water powers would be developed for only the minimum flow of the stream and all the kilowatt-hours in the water in excess of the minimum would not be developed. In California, and in fact all over the world except in very few exceptional cases, the amount of such a minimum power is so small that it would not form a satisfactory supply for commercial power systems.

This condition of stream fluctuation emphasizes the futility of statements that are frequently made by economists, congressmen, chambers of commerce, and others that a certain territory has a potential resource of a certain number of horsepower of water power. Without the qualifying knowledge of the amount of co-ordinating steam needed, such a statement is worthless as a measure of the value of the territory as a power producer. The whole economic situation from a power viewpoint must involve flow characteristics, cost of fuel, economy of steam plants, and cost of plants of both kinds.

The high economies that have been obtained in the recently completed steam plant of the Los Angeles Gas and Electric Corporation at Seal Beach, and the Southern California Edison Company at Long Beach, have made a decided difference in the situation. While the older steam plants in California have economies of 200 to 260 kw-hr. per barrel of oil under full-load conditions, the economy of these new plants is of the magnitude of 425 to 450 kw-hr. per barrel. At such efficiencies the fuel cost with oil at $1 per barrel ranges from 2¼ mills per kw-hr., a figure so low that additional stream-flow plants in California are practically out of the question, and plants having storage facilities must be scrutinized more carefully than heretofore. Only an increase of several hundred per cent in the price of fuel can change this condition.

Where the Radio Dealers Do Play Ball

A SHORT time ago an editorial appeared in the columns of the Journal of Electricity urging that radio dealers refrain from blaming interference on the power company and take steps to make their customers understand the multiplicity of causes to which their trouble may be due.

It perhaps will be of interest to Journal readers to know of the work already being done toward this end in the district covered by the Pacific Radio Trade Association. This organization, with headquarters in San Francisco, is a co-operative body made up of representatives from all branches of the radio trade. It is the sponsor of the annual radio show held in San Francisco and furthers all measures for the betterment of the radio industry on the Pacific Coast. Recently the association has issued an interference data blank for the use of radio retailers who come up against the situation dealt with in the Journal of Electricity editorial.

PACIFIC RADIO TRADE ASSOCIATION

INTERFERENCE DATA BLANK

From .....
(Name) (Phone)

.....
(Address)

Type and make of set .....

Kind of interference: Hum (.....), Hiss (.....), Roar (.....), Squeal (.....), Tap (.....), Buzz (.....), Crash (.....), Surge (.....).

Time that interference occurs .....a.m. .....p.m. .....Day.

Does it cover entire dial? (.....) or near what stations on dial (.....)

Is it continuous? (.....) or intermittent? (.....). When first noticed? (.....)

Does it continue when you pull the main service switch supplying your home with light and power? (.....) or when your neighbors pull their switches? (.....)

Has anyone who understands radio sets and circuits examined your batteries and your set? (.....). If so, to what did he assign trouble? (.....)

Do you, or does anyone in your neighborhood operate oil-burning furnaces, elevators, small motors, violet ray or X-Ray machines, or other electro-mechanical appliances? (.....) Ever turn them off to see if they might be causing the trouble? (.....)

State type of batteries (A, B, and C) used, and B Eliminator if no batteries.
(.....)

Aerial height..... Length..... Parallel to other wires?.....

Where is ground connection made?..... Is lead-in a separate wire? (.....). Is it soldered? (.....). Is aerial insulated from trees and other grounded material? (.....). Is it fastened at either end to lighting or telephone poles? (.....). How many blocks from the nearest street car line? (.....)

With aerial and ground wires disconnected and their binding posts connected with a wire, do you still get the interference? (.....)

What other listeners in your vicinity are having the same trouble?

.....

.....

.....

What is the best time of day to call?.....

These questions should be answered by the person bothered by the interference and this sheet then returned to the Dealer from whom it was obtained. His service man can determine whether the trouble is within the set or whether it comes from an outside source. In the latter case, he should refer it to the local radio club, or power company for investigation. Should they be unable or unwilling to locate the noise source, this report, as a last resort, may be forwarded to the U. S. Supervisor of Radio, Custom House, San Francisco, for such action as he deems necessary.

Furnished by.....
(Dealers' Name)

By means of this information blank, used by the Pacific Radio Trade Association in receiving radio complaints, the dealer is able to trace definitely the source of trouble and, co-operating with the power company when necessary, assist in having it cleared.

In place of blaming the trouble on the power company, the radio dealer hands the customer complaining of interference one of these blanks from the pad kept always on his counter. The questions asked call for information as to names, address, type and make of set, and nature of interference. In addition, the complainant is asked to specify whether the interference covers the entire dial, at what hour it occurs, whether it is continuous or intermittent, and when it first was noticed.

Details are asked as to the set, whether batteries or eliminators used, the aerial height and construction, whether soldered, insulated from trees and other grounded objects, fastened at either end to telegraph poles, near a street car line, and the like. In addition, the owner is asked if he has had his set examined by anyone who understands radio, whether he has experimented to see if the interference continues when the main switch governing the power in his home is pulled, or when that in the homes of his neighbors is pulled. He is asked if he possesses, or if there are in the neighborhood, elevators, oil-burning furnaces, small motors, violet or X-Ray machines or other electro-mechanical appliances, and whether he has experimented to see if the trouble continues when these are not operating.

If at the conclusion of his examination, or that of the expert he calls in, the trouble still seems to fall at the door of the power company, the blank with all its attendant information is forwarded to the power company in question which is, as a rule, very glad to follow up the difficulty. As may well be imagined, however, the set usually is repaired by that time, the aerial moved, or the violet-ray machine shut off. The power company is saved considerable expense of examining difficulties not properly laid at its door—and the set owner is saved a feeling of grievance against the central station. This is one form of playing ball on the part of the radio dealer that is greatly appreciated by all concerned.

Oregon Public Ownership Bills Fail

NEITHER of the initiative measures designed to place the state of Oregon in the business of electric power generation and distribution, namely the so-called "Housewives bill" or the Grange bill, received enough signatures to qualify for a place upon the ballot this year, according to late advice from Oregon. The "Housewives" measure received over 13,000 signatures, but was barred by the Attorney General who declared that it would require in excess of 14,000 signatures, based upon the percentage of votes cast for supreme justice at the last election. It is understood that the promoters of the "Housewives" measure will take the matter into court in an attempt to have the measure placed on the ballot.

The Grange bill, which was being submitted by the Oregon State Grange, was withdrawn before the date set for filing of petitions, on account of lack of signatures. A third measure initiated by the Oregon State Grange, the Public Ownership League of Oregon, and the Hydro-electric League of Oregon, was also abandoned.

CENTRAL STATION CONSTRUCTION OPERATION AND MAINTENANCE

Record System Is Aid to Locomotive Maintenance

Careful Check on Storage-Battery Locomotive Operation Facilitates Thorough Equipment Maintenance

By HECTOR KEESLING, Assistant Engineer, General Construction Department, Pacific Gas and Electric Company, San Francisco

Storage-battery locomotives were very important factors in the construction of the Pit 3 tunnel. All of the hauling in conjunction with the driving of the tunnels and their concreting was done by these locomotives, of which there were 10 on the job.

Of these locomotives 8 were purchased new for this job, each complete with battery. Five extra batteries were purchased and distributed among the charging stations so that the locomotives at all times were able to change a discharged battery for one which was charged. The locomotives were G. E. type LSB-2-C 6-ton (nominal), each equipped with 88 cells of Exide MV-17 iron-clad batteries grouped 8 cells per tray and mounted in 2 steel compartments. Six trays were installed in one compartment and 5 trays in the other. Rated discharge capacity of the battery was 45.5 amp. for 6 hr., equivalent to 47.5 kw.-hr. They charged at 45 amp. normal rate and at 18 amp. for the finishing rate, voltage 170 average.

The locomotives were provided with steel-tired wheels. Chassis weights were 10,000 lb. batteries and compartments 5,900 lb., making the total weight 15,900 lb. They had a nominal rating of 2,400 lb. draw-bar pull on level track at a speed of 3½ mi. per hr. Principal dimensions of these locomotives were as follows: track in., wheel base 54 in., overall width 61 in., wheel diameter 20 in., maximum height above rail 45 in.

The other 2 locomotives used were Baldwin-Westinghouse class 4-2-10-C226. These locomotives are old-timers, having been shipped from the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Company Dec. 21, 1908. They were built as trolley-type locomotives with 24-in. diameter wheels and a gage of 24-in. The chassis weighs 4 tons. They saw service on the Los Angeles Aqueduct where they operated as trolley-type, and on some preliminary work done by this company on the Big Bend project on the Pit River. The trolleys were abandoned at that job and a battery arranged on top of the chassis. For the Pit 3 job the gage was widened to 36 in. and a larger battery provided. This battery consisted of 88 cells Exide MV-15 iron-clad batteries assembled in 11 8-cell trays and mounted in a single steel container box. The battery and box weigh approximately 5,000 lb.

Considerable trouble was encountered with axles breaking because of the large additional weight of batteries loaded on top of the chassis, resulting in a high center of gravity which was particularly severe on the axles, since the gage had been widened. Special axles of heat-treated steel did not eliminate this trouble. If these locomotives are to be used in future jobs the size of the axles probably will be increased. The wiring of the locomotives for the new battery installation was revamped by company forces. The mechanical changes on the locomotive were made at the shops of the Pacific Car and Equipment Company, South San Francisco, who also made the steel battery containers. Other than the axle breakage the performance of the locomotives was good.

Throughout the tunnel 50-lb. rail was used and gave a comparatively good construction track which safely permitted considerable speed. The G. E. locomotives hauled two 6-cu. yd. cars loaded with excavated material up a grade of 3 ft. per 1,000 ft. at a speed of approximately 6.6 mi. per hr. With two empty cars, returning to the heading on a downhill run of the same grade, the locomotives traveled at about 8.6 mi. per hr. The speed, hauling concrete cars, was about the same as the above with 2-car trains, each car having a capacity of 2½ cu. yd. of mixed concrete.

The Westinghouse locomotives handled the same number of cars of muck at about the same speed, but the loaded cars were hauled down grade and the empties up grade. These locomotives were not used on the tunnel concreting work because they were kept busy hauling excavated material from the surge chamber. This latter material was trapped into cars in the surge chamber tunnel, a tap tunnel from the main tunnel line.

Installations necessary to the driving and concreting of the tunnel, such as blacksmith shop, timber framing shed, ventilating machinery, etc., were set up at each point from which the tunnel was portaled. Such installations included battery charging plants and were 4 in number; at Intake, Rock Creek, Adit and Lower Portal. Two G. E. locomotives were used at Intake, four at Rock Creek and two at Adit. The two Westinghouse locomotives were used at the lower portal. A 15-kw. charging set was installed at each of these places, but later on it was found advisable to augment the Rock Creek charging plant with an additional motor-generator set of 25-kw. capacity. This was necessary on account of the long hauls in the headings at this place.

Details of one of the charging stations are shown in Fig. 1. In addition to the power and light services these stations were piped for air and water. A pit beneath the track permitted inspection of the locomotives from underneath. For the sake of convenience, in the future charging stations, the motor-generator sets and switchboard will be located on the same side of the building as the storage and tool room to avoid having to climb over the batteries and supporting structure when going back and forth from the charging set to the shop or tool room.

To change batteries the locomotives were run into the charging station and the batteries to be charged were hoisted from the locomotive and landed on timbers bridged over the track. The locomotive then was moved to a position directly beneath a charged battery which was lowered onto the chassis. Each section of batteries was handled by

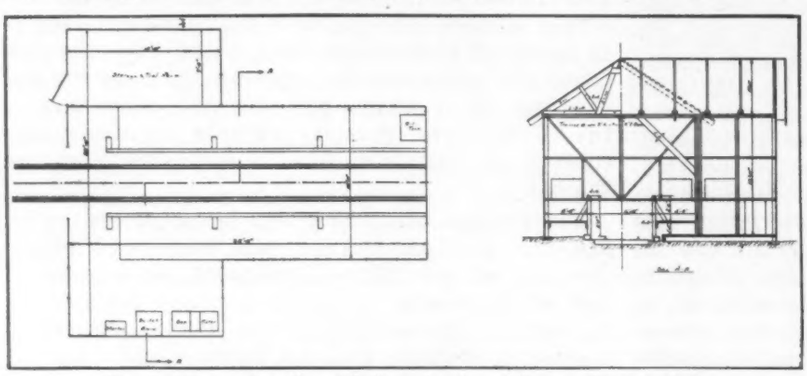


Fig. 1. Plan and section of battery-charging station on Pit 3 project.

means of a 2-ton chain-block with trolley running overhead on a 6-in. I-beam the full length of the locomotive track inside of the building. Chains with hooks which engaged in slots in the sides of the steel battery containers were used with the chain blocks. Ordinarily 4 men were used to make a battery change; 2 laborers called in from adjacent work, the motorman, and the attendant of the charging operations. The lift was approximately 3 ft. and the change took about 20 min. It was necessary to break the battery connections between the two sections before moving the sections and to make up the connections again when hooking up for charge or after setting the batteries back on the locomotives. Some argument was advanced toward installing a power lifting device capable of lifting both sections of the battery at once. Speed was essential in the battery change to keep the headings supplied with cars. The power lift will be considered on the next installation with a view to cutting down manual labor. Also it will eliminate the risk of short-circuiting the battery through the loose ends of the battery connections between sections.

One maintenance man was stationed at each of the charging stations. He looked after the ordinary charging of the batteries, the weekly equalizing charge, and the monthly overcharge. When the batteries were on the charging rack they were washed off with water and blown with air to dry off the water. This move kept the cells in good external condition, reducing any chance for sneak currents, and kept electrolyte from getting on the trays and on the locomotive. During the time the batteries were being changed the maintenance man inspected and oiled the locomotive. The controllers were inspected each day and minor repairs made to them as needed. Headlights were cleaned and replaced and small repair jobs done. In addition to the duties above mentioned this man replaced broken and burned out lamps in the tunnel sections near his station.

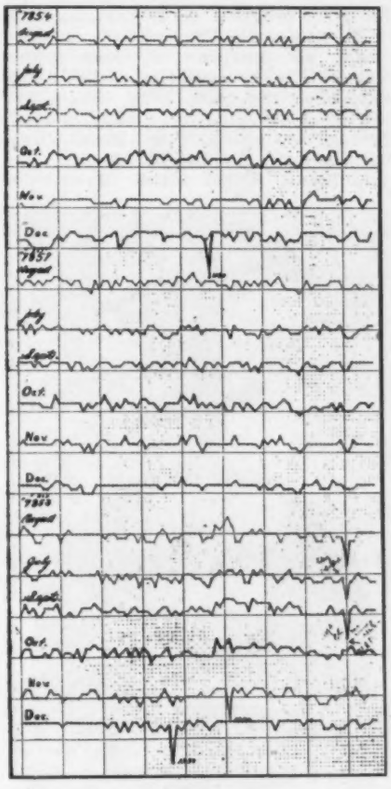


Fig. 2. Typical section of chart showing monthly plottings of every cell in a battery group, in this case battery No. 7854. It may be noted that all weak cells show up at once and that necessary attention may be given at once.

Reports

A full daily log covering all of the charging stations was made out by an electrical foreman whose particular province this was. A series of typical reports follows:

DAILY REPORT
April 5, 1925
Portal 1 (Diversion)

Oiled motors on locomotive No. 9459 to prevent concrete from sticking on frames.
Portal 2 and 3 (Rock Creek)
Repaired cell No. 4 in battery No. 7854 and found a piece of lead wedged between 2 cylinders of the + plate and the separator punctured causing a short from + to — plates.
Portal 6.
O.K.

DAILY REPORT
April 13, 1925
Portal 1
O.K.
Portal 2 and 3.
Fingers arcing in controller on locomotive No. 9460 repaired and put in service O.K.
Repaired lights and fuse on locomotive No. 9460. Cleaned commutator and adjusted brushes on locomotive No. 9457. Oiled locomotive No. 9461 to prevent concrete from sticking.
Portal 6.
Put new bearing in motor No. 2 of locomotive No. 3425.

DAILY REPORT
April 21, 1925
Portal 1.
O.K.
Portal 2 and 3.
Headlight reflector broken on locomotive No. 9460, replaced by new one.
Replaced fuse on battery No. 7853, which was blown.
Cell No. 66 on battery No. 7834 broken beyond repair—caused by rock blasted from quarry. Put jumpers around cell until new one was received.
Portal 6.
O.K.

DAILY REPORT
April 22, 1925
Portal 1.
O.K.
Portal 2 and 3
Put new terminal on cable battery No. 7861.
Armature taken out of motor generator sets No. 2 and No. 3 15 kw. and commutators turned down.
Portal 6.
O.K.

A monthly operation summary also assisted the keeping of a full check on battery conditions. A typical example follows:

MONTHLY OPERATION——TO BE FILLED IN BY OPERATOR

Gravity Reading of Each Cell Upon Completion of Equalizing Charge

Cell	Gravity	Cell	Gravity
1	1.280	2	1.282
3	1.280	(data kept on each cell in each battery)	
87	1.281	88	1.281

PIT 3 DEVELOPMENT

BATTERY OPERATION REPORT FOR MONTH OF SEPTEMBER, 1924

Battery No.— 12796
Location— Camp 9 (Adi
Operator— Bund

Daily Report to be Filled in by Operator
Amp.-Hr. Meter Readings

Date	On Chge.	Off Chge.	Date	On Chge.	Off Chge.
1	x	x	16	170	0
2	150	0	17	x	x
3	190	0	18	200	x
4	x	x	19	x	x
5	x	x	20	x	0
6	x	x	21	200	0

Etc., Etc.

x denotes that battery was out on locomotive or was on charge on that date.

Weekly Operation Report to be Filled in by Inspector

Watered—	9/2	9/13	9/23
Cleaned—	9/2	9/13	9/23
Equalizing Chg.	9/4	9/14	9/24
Gravity of Pilot Cell when Equalizing Charge Completed	1282	1300	1285

These reports were turned in to one of the electricians who acted as a battery inspector, in conjunction with his other duties. He assisted in pulling cells for repairs and compiled the operation reports. The daily log showed the routine work done and detailed the repairs made to locomotives and batteries. The nature of troubles found in faulty cells, detected by the monthly gravity readings, also showed in the daily log. The space for daily report data showed the number of cycles of charge and discharge the battery was given per month and prevented the motormen from discharging the battery to too low a point. Under the weekly operations the dates of watering, cleaning and of the equalizing changes were recorded. The space on this sheet for monthly operating data was not used but the gravity of each cell after the monthy overcharge had been given was recorded on another sheet.

Curves plotted from these gravity readings, a typical section of which is shown in Fig. 2, showed at a glance the condition of each cell. The defective cells could be picked out readily on account of the low gravity and special attention given them. Causes of abnormal drop in specific gravity of the electrolyte were found to be mainly broken separators and shorts caused by pieces of lead left in by the factory in assembly.

During the 1½ years the batteries were in use about 6 jars were broken, due mainly to collisions. One cell was damaged beyond repair by a flying rock from a quarry blast.

Some trouble developed with the amp.-hr. meters due to sweating and subsequent rusting. This sweating was caused by the difference in tem-

perature inside and outside the tunnel which caused moisture to condense on the inside of the meter case, due to the internal heat in the meter. To overcome this the meter was enclosed in a sheet metal house in which incandescent lamps were burned. It is thought that some sort of a cushion support such as the spring support used on the G. E. headlights should be used for supporting these meters to lessen the jar on them.

Following are some comments on the equipment including recommendations of changes which it is thought will better the installations:

Tops of battery containers furnished were too light. They should be strong enough to permit loading drill steel, drills, and miscellaneous tools on top of the locomotives so that this material can be hauled in and out of the tunnel without having to couple on a car for hauls of this kind. On the job a false deck of 2x12-in. planks was provided for the top of each battery.

The headlight fuse location should be changed. It now is placed on the locomotive chassis between the two sections of the batteries and fuses cannot be renewed with the battery in place.

Receptacles for attachment plugs for extension lights, particularly for the red tail lights on the cars, should be installed on the locomotive.

The headlight switch should be located so that the motormen do not kick it to close it.

The flexible hoses for oiling main journals were removed because they caught on picks and other material and equipment piled alongside of the track. Pipe plugs were installed in the tapped holes of the journal boxes.

The controller resistance grids were covered to avoid breakage from material flying up from underneath.

The alarm bells were too weak for proper warning. The construction of the overload and reverse-current breakers on the charging panels was too light. Brush contacts pit and current flows through carbons of arcing tips. Stud through panel board pulled loose when nut in rear was tightened. The sheet metal used in making the operating handles is not satisfactory, since these handles continued to break until all of the metal originally furnished with the switches was replaced by other metal on the job.

The generators of the motor-generator set should be flat-compounded if the constant voltage system of charging is to be used. The compounding of the generators on this job was not as good as desired, the generators being somewhat unstable, but the manufacturers have agreed to take care of this before the sets are used again.

While considerable attention was given to the locomotives and batteries it is believed that the costs have been justified, since the equipment completed a year and a half of strenuous hauling without any serious delays and is in good condition at the end of the job.

Shut-Down Order Standardizes Installation System

By W. C. FOSTER, Assistant Operating Engineer, Portland Electric Power Company.

Methods for shutting down lines or equipment for repairs have been worked out by the Portland Electric Power Company to a very full extent.

When the line, underground or station construction departments wish to have lines or equipment shut down for repairs or for construction purposes the superintendent of the department desiring the shut-down fills out a "shut-down order." This order form is made out in duplicate and notes in detail the line or equipment desired, the time it is to be ready, the work to be done, by whom requested and who will do the work. This order form is shown in the accompanying illustration.

If there are customers on the lines to be shut down, the orders first are sent to the service department. The service department keeps a file of the more important customers on each line. Upon receipt of an order the service department calls the customers that will be affected by the shut-down and explains the situation to them. If no serious objections are encountered a "Customer's Consent" sheet giving the customer's OK is filled out and attached to the order and both are sent to the operating engineer's office.

At the office of the operating engineer the "Shut-down Orders" are checked over. If operating conditions permit, the order will be approved,

PORTLAND ELECTRIC POWER COMPANY

No._____ SHUT DOWN OR HOLD ORDER

SHUT DOWN ORDER

Line or Equipment:

to be shut down from ____ M. Date ____ to ____ M. Date ____

Work to be done:

Shut down requested by: Date

Shut down to be called for by:

Customers notified by: Date

Shut down approved by: Date

Clearance given to: M. by

Equipment cleared by: M. to

Remarks:

HOLD ORDER FOR NEW EQUIPMENT

Equipment to be held:

Hold Order requested by: Date

Hold Order approved by: Date

Equipment held / For Workmen — Reported clear, Date M.

Reported clear, Date M.

Reported clear, Date M.

Reported clear, Date M.

Reported clear, Date M.

Equipment held for / Engineers' Approval — Approved Date M.

Approved Date M.

Approved Date M.

Approved Date M.

Remarks:

Form used by the Portland Electric Power Company to order the shutting down or holding of any line or equipment. It is circulated to interested parties and standardizes the methods of handling.

assigned a serial number and any necessary remarks concerning procedure added. After approval of an order the original is sent in to the load dispatcher and the copy is returned to the department requesting the clearance.

On the same sheet as the above order is a "Hold Order for New Equipment." When any new line or equipment is being constructed or installed the department under which the work is to be done fills out this hold order giving full information as indicated in the accompanying illustration.

When filled out this order is sent to the operating engineer's office for check and approval. Here, too, are added the names of the different superintendents and engineers who are responsible for the different phases of the job and copies are sent to each of them. Before any line or equipment is released for service an approval must be secured from all of the men whose names appear on the hold order. This form of orders was adopted so that the dispatcher could have advance notice of the installation of new equipment. When finally filled out and containing the release approval of each of those interested in the job it constitutes authority to the dispatcher enabling him to put the equipment into service.

The order sheet is orange in color so that it is readily distinguishable from the other papers in the dispatcher's office.

Tags Bring Pole-Top Information to Convenient Level

By C. L. LAWRIE, Assistant Superintendent, Record Department, San Diego Consolidated Gas & Electric Company, San Diego.

A system of equipment identification as worked out and applied by the San Diego Consolidated Gas & Electric Company is shown in the accompanying illustration. The tags are affixed to the pole at a height of about 6½ ft. from the ground and, reading from the top down, they give the name of the company owning the pole, the individual number of the pole by which it can be identified with its card in the office, the year it was set ('24), the system number of the transformer station which also corresponds to a card in the office files, and the size of the transformer. At the top of the same pole the transformer station number may be seen in larger figures on the kick-arm. It will be noticed also that there is a telephone arm on this pole, making it a joint pole; this fact, too, is indicated by the prefix P on the pole number tag.

The advantage of the tags shown in the fact that they may be read under all conditions of weather, night or day. They do not require a line crew to install but can be nailed on by unskilled labor while construction of the line is in progress or by the inspector of finished work. They may be changed readily and inexpensively when necessary. With the exception of the name plate and the year nail, which are purchased in quantity "ready made," the tags are produced on an embossing machine using No. 24 B&S gage, ⅞-in. strip brass. Other metals have been

Typical pole-top installation and (insert) tag system which brings all information regarding the pole and its equipment to a convenient height.

tried, such as aluminum and zinc, but it has been found that while in many localities the aluminum tag remains in good condition for five or six years in proximity to the sea coast it disintegrates quite rapidly. The zinc tag apparently has even less resistance to atmospheric corrosion often failing in a year or less. The brass tag, together with the copper nails, costs about 2 cents.

The embossing machines, of which the company uses several, may be installed at main storerooms, in branch offices, on company trucks or on the backs of the inspectors' cars. Where the tags are to be placed by the line crew they are made at the storeroom and sent out with the other material for the job. When for any reason the inspector is charged with this work he makes the tags on the spot. This arrangement is very convenient also in the not infrequent contingency of inspection of new work revealing an incorrect or missing tag; in those cases where one or more of the tags on a pole must be changed for some reason not involving the work of a construction gang.

Portable Camp Facilitates Line Construction Work

By C. S. KNOWLES, Superintendent of Construction, Pacific Power & Light Company, Kennewick, Wash.

Facing several years of transmission-line construction across barren, unpopulated country, the construction department of the Pacific Power & Light Company thought it necessary to devise some workable system of housing and feeding a construction crew without having to rely on towns. Some sort of portable camp outfit, which would make the men comfortable and which could be moved with a minimum of delay, was desired. After some experimenting the author devised and built a camp outfit that has met adequately the requirements of economy in first cost, economy in operation, and comfort for the crew.

The outfit consists of six tent wagons, called cars. These were constructed by erecting a 2x4 framework on the beds of low iron-wheeled, truck-type farm wagons manufactured by the Moline Plow Company. These frames, which define a room 20 ft. long by 8 ft. wide by 6 ft high, are covered with tent canvas so arranged that the sides can be raised two feet all around for ventilation. This 2-ft. space is screened against flies and insects, and screened doors and windows are provided. With each wagon carrying its own quota of camp equipment, the time and work of moving camp is reduced to a minimum. It is necessary only to hook the wagons on behind trucks and draw them at a maximum speed of about ten miles per hour to the new location where making camp is a matter of only a short time.

The six tent wagons were designed to take care of a standard construction and camp crew of 30 men. Three of the wagons are "sleeping cars." Each contains eight bunks completely equipped with mattresses, blankets, sheets and pillow cases. One "office car" contains a desk, typewriter, adding machine, and other office equipment and, in addition, four more bunks. These cars, with a small tent for the cook and his helper (on some jobs these two have been man and wife), account for the sleeping accommodations for the crew.

By careful conservation of space the "dining car" was made to hold built-in tables and benches to seat 28 men at one time, so that it is not necessary to run a second table. All table utensils are kept in this car. The kitchen car is equipped with a camp range, sink and work table, hot water system, and a full complement of pots, pans and kichen equipment of all kinds. The stores of extra food also are kept in this car. In setting up camp it is customary to place the kichen and dining car end to end, so that the cooks' work may be facilitated and so that no time is lost between the range and table. The total cost of the entire outfit, including all equipment, was about $3,000.

The 30-man crew is composed of the following: one foreman in charge of camp and crew; one clerk to keep time, check material, buy food and supplies, pay bills, etc.; one cook; one cook's helper, who acts as general utility man and camp roustabout, and also threads bolts, bores arms, and does such other odd jobs on the construction work as is possible in camp; one carpenter; 4 truck drivers; 5 linemen; and 16 laborers. This has been found to be the most economical number of men to handle in one crew to take care of in one camp.

Realizing that speed and economy in any construction work depend in part upon a satisfied and harmonious working crew, considerable thought was given to those features of the camp having a bearing on the men's comfort and pleasure. Food served is the best that can be procured and is prepared by good cooks having at hand all the facilities for maintaining a sanitary kitchen. Good beds and bedding in well ventilated sleeping quarters kept clean by the camp roustabout, hot water for washing, shaving and bathing, certain adequate sanitary regulations, all these elements have contributed to the comfort and well-being of the men. To provide a measure of entertainment during the evenings when the camp is located far from any town a radio was installed and made a part of the permanent equipment of the office car. A certain amount of camp discipline as to recreation is enforced. All games are stopped at 10 p.m. In short, the various elements making up satisfactory working conditions, simple enough to secure in a permanent camp but more complicated in a portable one, are made easier of achievement with the camp outfit described than with any other arrangement heretofore tried by the company in its moving construction work.

In operation it has been found economical to move camp by 6-mile stages. This means that the crews work 3 miles in either direction, causing an average working haul of only 1½ miles. Since the average speed of line-building has been about ½ mile of completed line per day, the camp remains in one place from 10 days to two weeks. Altogether, it is believed that this camp outfit has been a large contributing factor in a number of excellent cost records made recently in transmission-line construction.

A New Use for an Electromagnet has been found by Western engineers. The Idaho State Highway Department followed the lead of an Idaho mining company in using an electromagnet to remove pieces of metal from the surface of gravel roads. Certain portions of that state's highways have been giving motorists trouble due to the heavy collection of nails, wire, bolts, nuts and other miscellaneous metallic debris that has collected in the surface gravel. The "dry cleaning" process is accomplished by suspending a heavy lifting magnet from the rear of a 5-ton truck and in such a position that the face of the magnet is about 4 in. above the road surface. The first five miles of roadway treated netted 150 lb. of miscellaneous scrap metal. In the course of three trips made over certain portions of the Yellowstone Trail over 600 lb. of nails and scrap iron were retrieved.

Fig. 1. Left—interior of "diner," or chow wagon, which is arranged to seat 28 men at one time; kitchen shows in the background. Center—interior of kitchen; this is a separate wagon and usually is backed up to the "diner," forming practically a single unit. Right—bunk wagon, or "sleeping car;" complete except for canvas covering.

IDEAS FOR THE CONTRACTOR

Pumping Water for Irrigation with High Lifts

Unusual Installation with 350-ft. Lift Proves to Be a Profitable Investment in Orchard

Engineers frequently have contended that pumping irrigation water on high lifts cannot be done economically. One installation which is thought to have the highest lift for commercial irrigation work has been installed in Medford, Ore. The installation is proving to be profitable and should encourage others to develop hillside tracts on the Pacific Coast.

Medford is located on the floor of a valley but many of its best orchards are on the side hills above the water line of the gravity systems. The tract with which this article deals is known as the Mira Vista Orchards, owned and operated under the name of the Rogue River Properties Company, Inc. It is represented by John Pike and F. Otis Booth, both of Los Angeles, Calif., and is managed in Medford by Bert Anderson.

Without water this tract would be useless and would be back in brush in a short time. Owing to the steep hillside, it was considered a problem to put water on it, at a reasonable cost. This was solved by designing and installing a two-stage centrifugal pump to deliver water to five different lifts in the orchard. A better idea of this arrangement may be obtained from Fig. 1. The highest lift is 350 ft. up the hillside and approximately one-half mile from the ditch where water is available.

Fig. 2 shows the pump house, canal and concrete anchor on the pipe line. The pumping unit consists of two 3-in. DeLaval centrifugal pumps mounted on one iron base and connected in series as shown in Fig. 3. The motor also is mounted on the same bedplate and coupled direct to the pump by means of a DeLaval flexible coupling. The motor is a Western Electric 40-hp., 3-phase, 60-cycle, 440-volt and has a full load speed of 1,750 r.p.m. The wiring is all in conduit and the meter loop is covered by meter trim: A 100-amp. three-pole safety switch was used for the main service. Overload and undervoltage protection was secured by the use of a type CR 1034 compensator.

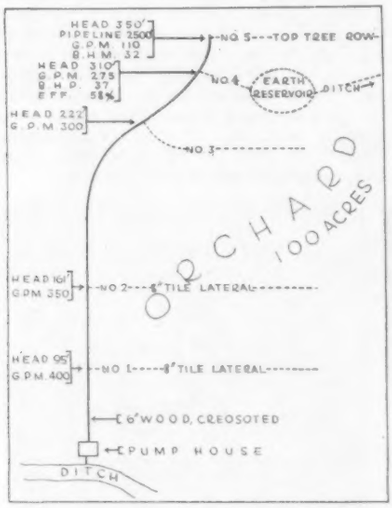


Fig. 1. Plan of system delivering water to five different lifts in the Mira Vista Orchards, Medford, Ore. The highest lift is 350 ft. up the hillside and approximately one-half mile from the ditch where water is available. The pump was designed to give the deliveries shown at the different lifts without overloading.

Fig. 2. Pump house on the bank of the main ditch of the Medford Irrigation District, showing the concrete anchor on the pipe line.

A pressure of 160 lb. when the pipe line is full made it necessary to select heavy pipe and fittings for all of the work. A check valve and heavy gate valve were placed in the discharge. The velocity of the water was one of the factors which entered into the design of the equipment.

The water is pumped from the main canal of the Medford Irrigation District and delivered to the five lifts along the 2,500 ft. of pipe line. The pipe line is a 6-in. American Wood Pipe Company's creosote-coated fir pipe laid underground. At the different elevations the water is spilled through iron gate valves into tile spillways set vertical. From these cement tile laterals lead across the orchard and distribute the water by gravity flow through small vertical tiles containing slide valves for controlling the streams for each tree row. It is necessary to limit the streams to about the size of an ordinary lead pencil in order to prevent erosion, as any amount of water quickly will wash a small gully in the steep hillside.

One of the interesting features of this installation is its flexibility in delivery, the first lift in the line being 95 ft. where 400 gal. per min. is available. The second lift is 161 ft. where 350 gal. per min, is to be had. The third lift is 222 ft. with 300 gal. per min.; the fourth lift 300 ft. with 275 gal. per min., and the fifth and highest lift is 350 ft. with 110 gal. per min. The design of the pump is such that its capacity is according to the deliveries given. In other words, the impeller does not overload on the lower lifts. It is practical to use small quantities of water from several "lifts" at once, the quantity being limited to the amount available at that point and the total capacity of the pump. The fourth lift also spills into an earth reservoir from which a ditch leads to supply another block of trees.

The irrigation district's charge for water rights on acreage below the ditch is $125 per acre, and the charge for acreage lying above the ditch is one-half of that amount, or $62.50 per acre. The district has taken into consideration the fact that an owner will be put to additional expense for pumping, and consequently has fixed the acreage charge above the ditch on the above basis.

In this particular instance with 100 acres above the ditch the water rights will amount to $6,250 for the entire tract, while the cost of pumping plant and pipe line was approximately $4,000. Had this tract been below the ditch so as to have been served by gravity flow, then the water right for the 100 acres would have been $12,500. It will be seen that the saving in the cost of water rights more than offsets the cost of the entire pumping plant. Further the yearly maintenance charge is cut in half, and the total saving is more

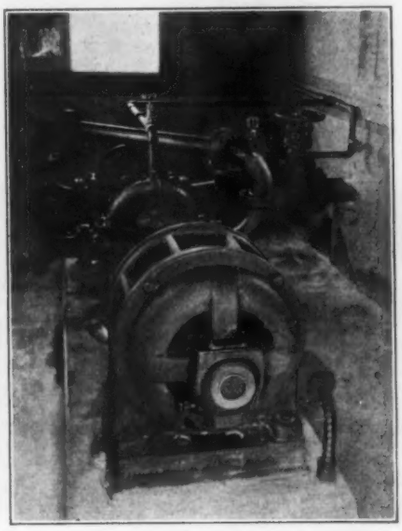


Fig. 3. End view of the pumping unit of two 3-in. pumps mounted on one cast-iron bedplate with the 40-hp. motor, direct connected by means of a flexible coupling.

than the usual cost for electric power and the interest and depreciation charges for the plant. The electric power is supplied by the California Oregon Power Company, and the rate

Fig. 4. Water is let into this vertical cement tile spillway from the pressure line through an iron gate valve. From this tile set on end 8-in. cement laterals lead out across the orchard.

for this unit is based on a charge of approximately $17 per horsepower-year with a total annual minimum of $700. This amount will take care of the usual season.

Fig. 5. Small vertical tile set on the lateral tile line, with small valves controlling the flow to each furrow.

Mr. Anderson conservatively estimates the increase of crop for the year 1925 to be not less than 2,000 boxes of fruit. Not only was the yield increased but the quality was improved and the trees had enough moisture supplied so as to show a good growth. The varieties of fruit grown were largely Bartletts, Bosc and Winter Nellis pears and Yellow Newtown apples.

Two good years' returns will pay for the entire cost of this equipment, and because of some natural advantages of soil and less frost danger this orchard is expected to become more and more profitable. The entire installation was worked out by B. W. Paul of Medford, Ore., including the elevations, length and size of pipe required, the concrete work, and wiring as well as the pump installation. All of the work was done by Paul's Electric Store under the supervision of Mr. Paul. The unit was designed and built by the DeLaval Steam Turbine Company at its Trenton, N. J., works.

This sign in back of the Star Electric Company in Bakersfield, Calif., states a truth that some men overlook.

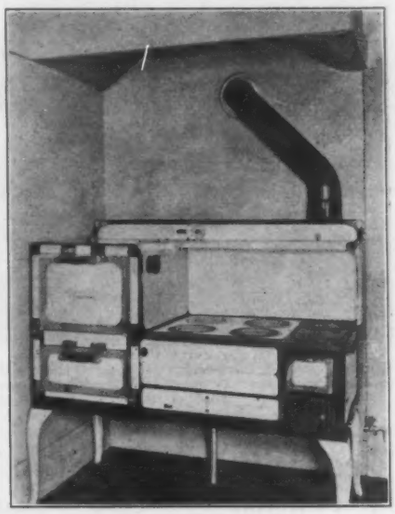
Home Heated by Central Plant and Hot-Air Ducts

An electric air-heating installation in which a central heating plant is used in connection with a system of hot-air ducts has been made in the home of Fred Suelberger, Oakland, Calif.

The furnace consists of 48 elements totaling 25 kw. An 18-in. fan driven by a ¼-hp. motor produces the forced draft and distributes the warm air to the various rooms. A canvas connection between the blower and the heating chamber prevents motor vibrations from being carried to the distributing ducts.

The air intake valve may be set to receive fresh air from the outside or the air may be drawn from the room and be reheated. The number of heating units connected at any one time is controlled by Cutler-Hammer relays mounted on rubber blocks. The relays are controlled by switches in the hall upstairs.

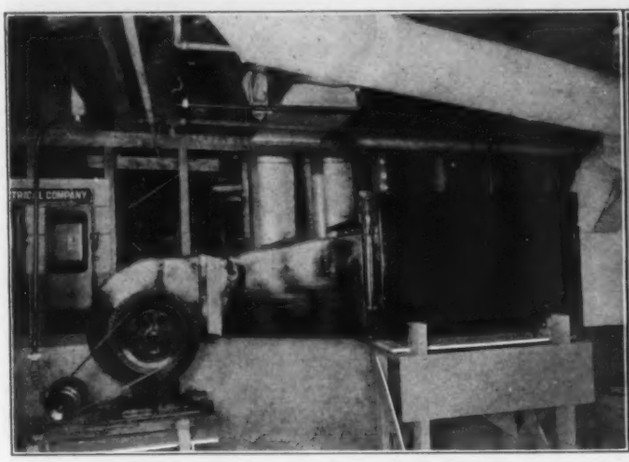
The furnace was manufactured by



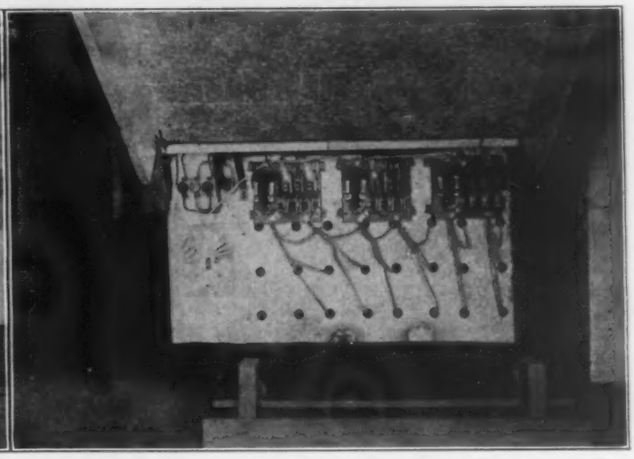
This 9¼-kw. range is installed in the home of Fred Suelberger in Oakland, Calif.

the Apex Manufacturing Company and was installed by H. Mellman, Oakland electragist. In addition to the heating equipment, the home contains a 9¼-kw. Monarch range. All of the electric equipment was sold by J. B. Sperry of The Electric Home Company.

Court Rules Against Similar Names for Stores in Same Block.—Terminating the controversy over trade names engaged in between the Electric Supply Company and the Electric Service Company, of Wenatchee, Wash., both firms having their places of business in the same block, the supreme court at Olympia has ruled that A. W. Hess, proprietor of the Electric Service Company, the more recently organized of the two, must choose a name more easily distinguishable from that employed by the older concern. The decision reversed the Chelan County superior court, which had refused to grant the relief sought by the Electric Supply Company.



Electric hot-air furnace and blower used in heating the home described in the accompanying article. Regular hot air ducts distribute the warm air.



Relays which determine the number of heating elements in use at any one time. They operate at 110 volts although 220 volts are applied to the elements.

General view of the service station of the California Petroleum Company in San Francisco. Three of the floodlights may be seen mounted on the roof of the rear service station.

Night view of the Calpet station showing the good floodlighting installation. One of the lighted air and water standards may be seen on the extreme left.

Electricity Important in a Modern Service Station

California Petroleum Company Floodlights Elaborate New Station Recently Opened in San Francisco

Electricity played an important part in the establishment of the higher standard of construction for service stations that was used by the California Petroleum Company in a new station at Post and Franklin Streets, San Francisco. This station cost approximately $80,000, excluding the pumping equipment. The station proper is constructed of glazed tile. The rear portion of the location is used for a battery station and a general automobile service station.

There are 24 lighting, one heating and one motor circuits in the station proper. Power is supplied from the power-company pole to the station by means of an underground service of three No. 0 wires. The general lighting in the station consists of ten totally enclosed diffusing units, four under each canopy and two in the salesroom. There are four circuits supplying the lamps in four copper signs in the station.

Each pump and oil stand is well lighted. The gas and oil tanks and the air compressor are located in the basement. The lights in the basement are installed in vapor-proof receptacles.

The rear service station is supplied with 18 lighting circuits, 15 hp. in motors, a d.c. battery-charging set, and two 2-hp. 3-phase motors on motor-generating sets for additional battery-charging equipment. This portion of the station is supplied with a four-wire overhead service consisting of two No. 0, one No. 1, and one No. 4 wires; also a d.c. service of two No. 8 wires.

This portion of the station is lighted with 200-watt RLM reflectors. Seventy-six 75-watt lamps are used as border lights around the face of the structure to provide yard lighting. The air and water standards in the yard each are lighted. Galvanized conduit totaling 3,700 ft. was used in making the installation.

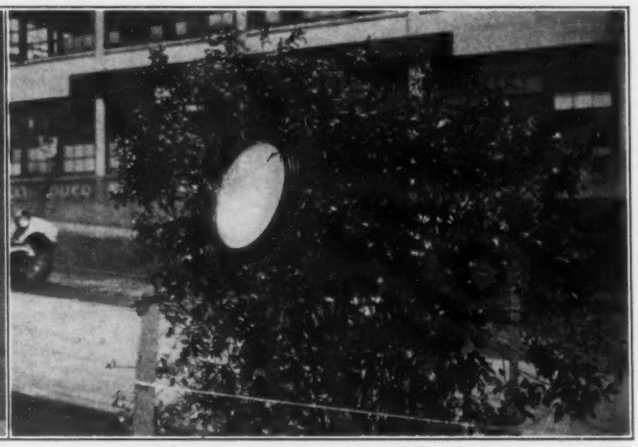
The station is floodlighted with six 500-watt GE L9 projectors. Each projector is equipped with stippled lens to eliminate glare. Without this protection against glare the rays of light would bother the drivers of machines coming into the station. In addition to these large projectors, additional light is thrown on the face of the salesroom by means of four Wheeler sign reflectors equipped with 100-watt lamps with glass protectors. These will be concealed by shrubbery.

Three of the projectors are mounted on the roof of the rear service station; two on pipe standards 15 ft. high, and one on a short pipe standard about 3 ft. high. This latter projector will be concealed by shrubs.

Victor Lemoge, electragist of San Francisco, made the wiring installation. After receiving the contract on the installation Mr. Lemoge built it up until the final amount of the wiring job was approximately nine times the amount of the original contract.

Contractors Have Little Difficulty in Selling Red Seal Homes.—That the Red Seal plan can be sold by contractors is evidenced by the activity of two contractors of Hayward, Calif. **H. H. Fenneman** of the Hayward Electric Company and **Hugo Frank** of the Frank Electric Company both are boosters of the plan, and each of them has four Red Seal homes under construction at the present time.

Four sign reflectors are used to supply additional light on the front of the salesroom. One of the floodlights mounted on a high pipe standard is shown on the left in the background.



One of the 500-watt floodlighting projectors with stippled lens which is mounted on a short pipe standard. In a short time this practically will be concealed by the shrubbery.

Auditorium and Stage-Light Control in Schools

A Description of the Modern Stage Switchboard Installed in the Compton Union High School

By LEWIS J. WELLS, Electrical Engineer, Safety Electric Products Company, Inc.

In the development of California the proper education of its present and future generations has not been forgotten. The average high school consists of a group of buildings, made up of class buildings, gymnasiums, shops, science halls, and the main auditorium. These buildings are very complete, especially as regards modern installations for the control of light, power, and often heat.

Dramatics are being taught in all of our schools. Without the proper control of light on the stage and in the auditorium theatrical performances cannot be presented satisfactorily to the interested public.

The consulting engineers of today are doing a great deal to assist the public and school board building committees simply by calling their attention to the need for this class of equipment at this time, by comparing past and present installations.

The switchboard of the past was hazardous while that of the present has all current-carrying parts insulated from its operator or people in its proximity. They also are constructed in such a way that the chances of fires are reduced to a minimum. There is a flexibility of light control obtained with the present composite semi-remote type of stage switchboard that could not be set up on switchboards manufactured only a few years ago.

One of the latest systems of stage switchboard as manufactured by the Safety Electric Products Company, Inc., has been installed at the Compton Union High School, Compton, Calif. This switchboard, known as the Diamond "S" composite semi-remote type, is different from the stage switchboards of past installations in that the individual control switches, master remote controls, dimmers and their operating levers, and magazine panel are built into one large unit. Individual plates are provided over each dimmer section and these plates are removable from the face of the board by removing four machine screws. On removing the plates the wiring to both the double-throw circuit switches and sectionalizing tumbler switches is accessible.

The color master and footlight control circuit is provided with a special plug type pilot light automatically indicating the color corresponding to the color control and the name of the circuit.

The color master switches are electrically held closed contactors, mounted in the main switchboard controlled by double-throw knife switches; one position gives direct actuation of the contactor, the other position transfers the contactor-control circuit to the stage and house master control switches. The stage master control switch is in parallel with a flush receptacle located in the lower trim of the stage switchboard, which provides a means for remote control away from the board. The remote-control operation is made possible by providing a flexible cable complete with plug and single-pole, single-throw push button control switch. The house master control switch is a special three-way knife switch on the stage switchboard so connected that this control is extended to the office and projection room.

The main busing consists of flat copper bus bar of such cross-sectional area that the current density is not more than 1,000 amp. per in. All other busing as from the circuit switches to the dimmers, individual tumbler switches, and to the magazine panel is slow-burning insulating wire, N.E. code capacity.

The magazine panel, which is of the dead-front, single fuse, plug fuse type, is mounted on one end of the switchboard concealed with hinged doors. The wiring from the circuit switches and dimmers is laid in 3 x 3-in. gutters, thus reducing the amount of exposed wire visible from the rear of the switchboard.

The dimmer bank is built into the stage switchboard and all the plates are rated to carry their full load continuously without injury. Each individual dimmer plate is interlocked to its color master which is in turn interlocked to a grand master lever. To make the dimmer control more flexible each pocket color is provided with a pocket master lever arranged for interlocking with the respective color master. All dimmers are connected in the neutral side of the circuit, thus eliminating the possible chance of a burnout by a short circuit to ground.

The angle-iron frame and unexposed metal is painted with black enamel while the exposed surface is finished with blue crackle lacquer, a durable protection for the metal under all conditions. All crackle lacquers are dull finish and therefore reflect very little light, which is a boon to the operator's eyes.

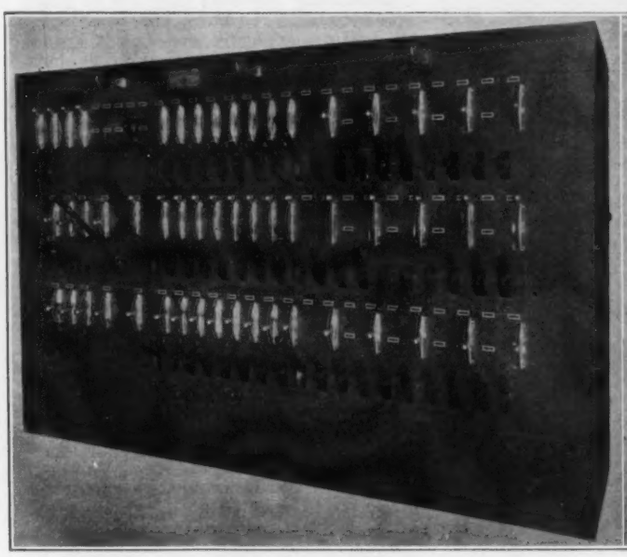
As this is a unit type of construction complete as a whole, the cost of installing is reduced and future upkeep expense to the owner becomes a minimum. This system is ingenious and simple enough to promise good service. The complete electrical installation in the school was made by the Baty Electric Company, electragists of Long Beach.

Utah Town to Extend Lighting System.—The city council of Payson, Utah, has decided to extend the whiteway lighting system of that town in the very near future. Lights will be installed along the west side of Memorial Park, which will add two more blocks to the system.

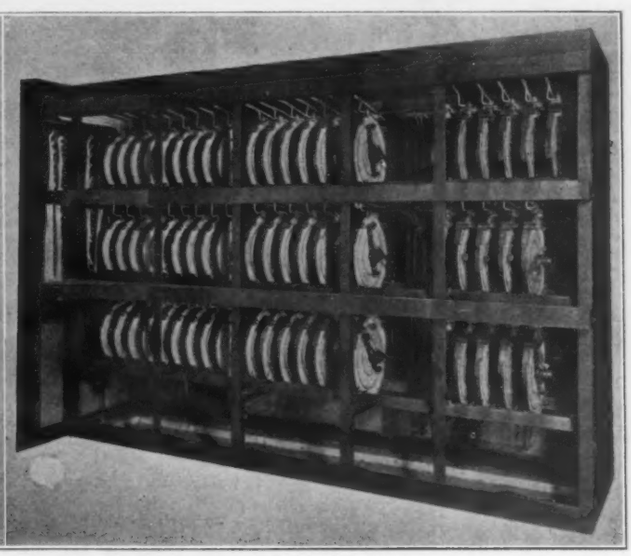
C. B. Harper, proprietor of the **Harper Electric Company,** 117 E. Chapman Street, Orange, Calif., has sold his business to **C. L. Alt.**

E. Krebs and **H. G. Blair** have opened **The Fontana Electric Company** in Fontana, Calif.

Burgess Electric Shop, Arcadia, Calif., has moved into new quarters at 148 E. Huntington Drive.



Stage switchboard installed in the Compton Union High School. This view shows the unit type of construction. Each horizontal row controls one color and each vertical row one color group.



Rear view of the board showing the rigid angle-iron frame construction, dimmer plates, wiring and wiring gutters to fuse compartment. The circuit fuse compartment may be seen on the left.

BETTER MERCHANDISING

Five Questions—And the Answers

House-to-House Selling, Special Sales, Lamp Sales, Fixtures, Windows and Advertising Discussed

Five pertinent questions were asked fifty or more dealers in electrical merchandise. For the most part they were well known and reasonably successful contractor-dealers. Many did not find time to answer the questions, but from those who did a very good cross-section of electrical merchandising sales policy may be obtained.

Electrical merchandising, at best, has been a hazardous undertaking in the past. Many dealers enthusiastic at the start have turned into more cautious merchandisers through sad experience. But there remains no reason why electrical merchandising cannot be made to pay, provided sales methods are developed out of that past experience which will serve as a guide in the future.

There are a number of successful electrical merchandisers. That alone proves that it can be done. But how?

The questions which were asked each of the dealers mentioned may be seen elsewhere upon this page. They are questions aimed at the very heart of selling policy. They are pertinent questions. They are almost impertinent, because the answers to them call for confession. The answers call for laying upon the table the trump cards of those who have played a winning hand. It took courage to answer them, and it took generosity of spirit, a willness to pass on to others the fruits of the dealer's own bitter experience.

For this reason the following letters answering the five questions named are significant. They are valuable in what they set forth. They are worth reading and thinking over.

"Found Ourselves Working for the Manufacturer"

Among the letters received one of the most complete was that of D. D. McFarlane, secretary-treasurer of the Newbery Electric Corporation, Los Angeles contractor-dealers well known for advanced merchandising policies and successful methods. These are his answers to the five questions:

1. "We do not use house-to-house salesmen in the manner in which we judge you mean from your question—having discontinued this practice three years ago, as we found it non-profitable, finding **ourselves** working for the manufacturer and the 'house-to-house' salesman, and not building up a clientele that would be of value to us in the years to come.

"We do, however, use salesmen who go to the homes and demonstrate to interested parties—this being particularly important in the selling of radio, as most of the demonstrations have to be made at night, when the programs are on.

2. "We do plan specials on appliances at reduced prices, with the idea in mind of attracting customers into our store by display of these specials in our windows. This program is being sponsored at present by the merchandising division of the California Electragists, Southern Section, and has the co-operation of the Edison company in its district offices, as well as the co-operation of the manufacturers and jobbers in this district. As nearly as possible, this plan is laid out to tie in with the N.E.L.A. campaign, which is, as you know, backed by national advertising in the different magazines.

3. "The only method we have used specially to promote lamp business is by the appointing of a specially trained lamp man, whose duty it is to call on every prospect that would seem eligible for a lamp contract. The rendering of service by prompt deliveries, special engineering data, etc., helps in maintaining the business already received, and by continually seeking new customers your business will naturally build up on the law of averages.

"We maintain a fixture department, and by specializing on certain classes of installations, which we are best equipped to handle, it could be considered profitable. In this department we have six salesmen.

4. "We consider our windows one of our main advertising plans, and can emphatically say that they are of great value to us. As they are practically of western exposure, we find it necessary to daylight them only a short time in the morning, and again in the evening during the winter months. Most of the summer season we have to keep our awning down to overcome the sun glare.

"We are very much in favor of efficient window lighting and do not stop to consider the cost of this form of lighting. Our windows must be changed once a week, and if special occasion arises, oftener.

5. "In the past we have not been consistent newspaper advertisers, using them more for special announcements, making a larger spread at seasonal changes, but during the past six months we have allotted a certain amount to newspaper advertising, for a given period, and then apportioned it to a small ad three times a week, and feel that this way has been of greater value than our previous method.

"You speak of special editions to commemorate some special event, such as the opening of an office building, banks, etc., and we cannot say that we

These Questions Were Asked

Five questions, each a potential mine of sales policy, were asked of leading dealers in electrical merchandise in California, Oregon, Washington and Idaho. The answers received to those questions will be found in the accompanying story. But here are the questions themselves:

1. Do you use house-to-house salesmen; if so what is your policy and what results have you noted? How do you select the best type of salesmen and what ways of following prospect leads do you use?

2. Do you, on occasion, plan specials on some particular appliance at a reduced cost, and do you use this method to attempt to sell other appliances to those who come in answer to the special advertising?

3. What special methods do you use to promote lamp business? Do you find the fixture business profitable, and have you special representatives on this work?

4. Do you find your windows effective; are you "daylighting" them during daylight hours?

5. Do you use newspaper advertising space regularly; do you use direct-mail matter in envelope-stuffer form or other forms? What do you feel about the value of advertising in special editions of newspapers brought out to commemorate some special event? Do you feel that this sort of advertising really pays or do you consider it, as many do, a sort of "contribution to charity" to the newspapers?

Read what prominent electrical dealers have to say in answer to these pertinent queries regarding sales policies.

agree with you that this is a contribution to charity, as we feel when we contribute to charity we have, at least, done some needy person a good turn, and cannot say that much in favor of these special editions referred to."

Oregon Dealer Finds Fixtures Profitable

E. L. Knight, proprietor of E. L. Knight & Company, electrical engineers and contractors of Portland, Ore., holds a number of differing opinions upon policies asked about in the five questions. In this territory he finds house-to-house salesmen necessary and successful and fixture business profitable. He says:

Electrical merchandise needs good salesmanship. The haphazard methods of the past won't do any longer. The electrical appliance has been discovered to be a money-maker by the department store, the drug store, the hardware store, and even 5-10-25-cent variety stores are taking to electrical merchandising such as it is. The buying public is no longer in the position of having to go to the electrical dealer for electrical appliances. And unless the electrical dealer uses aggressive selling tactics he is apt to find himself a worthy pioneer in the electrical merchandising game but nevertheless dropped in the procession long ago because he did not keep up. The purpose of this Better Merchandising Section of the Journal is to bring you electrical merchandising ideas, plans, policies and methods that are sound, practical, and tested by experience. If they are adopted and vigorously used they will bring rewards to electrical merchandisers and keep them at the head of the procession where they belong.

1. "We use house-to-house salesmen, and have had very good results. We select the best type of salesmen and follow prospects with personal calls.

2. "We plan specials on certain articles at reduced cost and our object in this is to get customers into the store.

3. "We have found the fixture business profitable, and have a special department. In connection with lamps, we stress the point to all salesmen of selling lamps when selling fixture orders, and have increased our lamp business quite materially due to this method. We also endeavor as much as possible to obtain lamp contracts which we find, if proper service is rendered, will be renewed each year and automatically increases the volume.

4. "We find our window advertising effective and the best method of advertising that we know of. We use some lighting during the day such as Mazda lamp displays and boudoir, table and floor lamps.

5. "We do not use newspaper advertising space regularly but do considerable mail advertising, and also envelope stuffers with our invoices and letters.

"In connection with the value of advertising in special editions of newspapers brought out to commemorate some special event, we do not feel that this is the type of advertising that really pays."

Mr. Knight voices a well-nigh universal experience when he says of retailing electric appliances in competition with drug stores, department stores and hardware stores:

"We might add that the retail department of our business has always been a liability as an electric dealer when selling heating appliances is expected to make repairs without charge whereas department stores, hardware stores, drug stores, etc., can sell this same apparatus and the customer will invariably bring it to the electric dealer for repairs."

But he shows how he is remedying the situation by extra sales effort in major appliances. He continues:

"To establish our retail department on a sound footing we have been forced to go out and campaign on vacuum cleaners, washing machines, etc., and are at present pushing domestic automatic refrigeration very hard, and are having good results."

Uses Electric Sign Effectively

From Eureka, Calif., came answers to the questions from two contractor-dealers, the Janssen Electric Company and the Eureka Electric Company, both Electragists. Both dealers reported that they did not use house-to-house methods, preferring to follow leads with their own sales staffs. The Eureka company does plan specials on appliances and, although it makes no special effort to promote lamp business, does find fixture business profitable and has a special representative doing this work. It does not daylight its windows, but believes in the value of window display to promote sales, making window display a feature. The Eureka Electric Company uses advertising space regularly and finds that direct-mail matter, particularly circular letters, "bring A-1 results." It, too, considers the special edition a worthless medium for advertising.

The Janssen Electric Company does not have specials on appliances, but by personal alertness and window display attracts much business to the establishment. Lamps are featured often in window display, and fixtures are profitable, "if handled right." This company makes much of its windows and often daylights them during the darker hours of the day.

Although it doesn't use newspaper space regularly, the Janssen company uses direct mail frequently, and is likewise opposed to the special advertising page. Its best advertising medium, it says, is a large electric sign, upon which the wording may be changed. Of this it states:

"We have a large electric reading sign which we have found to be the best advertising medium yet. Practically every day we get direct results from this sign. In fact manufacturers of specialty lines are paying for space on this sign. This is not a billboard but an actual sign hung in front of the store."

"We Hope Never to Attempt It Again"

That the house-to-house selling has its great disadvantages is borne out further by the experience of the McNally Company of Pasadena, Calif. This company tried the plan but found it to be productive of more grief than good. The letter of C. A. Rowley of the McNally Company contains much food for consideration and gives in detail many salient points as to how his company deals with peculiar local conditions. He says in part:

1. "We do not follow a house-to-house salesman policy at the present time. We have tried it and the trial

An attractive entrant in the National Lamp Works lamp-display contest held recently was this window of the J. B. Morgan Company of Pasadena, Calif. Although it did not win a prize, the window has been considered one of the most attractive in Pacific Coast displays. Moreover, it sold a lot of lamps.

resulted in a considerable amount of business, but it has been of a type not entirely satisfactory. Reversions have not been numerous, but collections take an amount of time entirely out of proportion to the amount of business obtained. We hope never to attempt it again. In this connection we want to say that we have very little respect for the type of salesmen usually procurable for this class of work.

2. "Yes, we do run special sales on appliances. At the present time we are tying in with the National Monthly Specials. Results have not been phenomenal, but all-in-all have been satisfactory. We have found that the specials act as a drawing card and that we are able to sell some merchandise at regular prices.

3a. "Our lamp situation is peculiar. The Pasadena Municipal Light Department supplies the public with lamps at a price slightly less than we can buy them for. This is due to the much larger discount they get on their lamp contract owing to the amount of business they do, which amounts to between $85,000 and $100,000 annually, figured at list. For this reason the average electrical dealer operates on an extremely small contract and is lucky to sell any lamps at all. We endeavor to sell lamps on every fixture job we do. We specialize on colored and fancy lamps, and make special efforts to have effective window lamp displays, etc., etc.

3b. "We do not find the fixture business profitable. Stock or box fixtures are handled here in Pasadena at an extremely narrow margin, there being branches of Los Angeles cut-rate houses here in town besides one or two local institutions which cater to the trade on price alone. Accordingly our fixture sales are very small, and usually consist of only a few "fill ins," or "extras." Now and then we sell fixtures for the service portion of large residences which we wire. We are not equipped to design and construct special iron fixtures such as are used in most of the best houses, therefore we are not in this field at all.

4. "Yes, we do find our windows to be effective. We make no attempt at lighting them during the daytime; but try to keep our trims fresh, and to change them frequently.

5a. "We use a small amount of newspaper space, depending on the regularity of our display to put over our story rather than the amount of space we use. We are not spending the amount of money that advertising experts recommend, in fact, our appropriation calls for only about half of what they advise, viz, 1½ to 2 per cent gross. We consider advertising in special editions, programs, etc., etc., an absolute waste of money."

Salesmen Don't Pull Doorbells

More leisurely and hence more complete was the information given by J. C. Hobrecht, electrical dealer of Sacramento, Calif., in a recent interview. Mr. Hobrecht described at length some of the more successful merchandising ideas and policies found to be helpful in his business. That fixtures are not profitable where damaging competitive conditions exist; that the lamp business is a profitable and continuous business; and that specials are important in sales were interesting sidelights given by Mr. Hobrecht. But of the house-to-house solicitation he had much to say.

Mr. Hobrecht does not have his salesmen "pull doorbells" in the accepted house-to-house way. He believes in sending his salesmen out to the homes of prospects but only to prospects obtained in more legitimate manner. He has a man who follows up all inquiries reaching the store from one source or another. All leads are followed carefully and reported upon. In the sale of radios especially is this true.

"In the radio department I would be out of luck without salesmen who can go out to the homes and demonstrate the sets, following all leads. I have five men in the radio department doing this work."

Full commission is paid salesmen for all floor leads given them which they are able to close. This stimulates the salesman to do his best. In the sales of washing machines a demonstration of the machine is given and careful follow-up of the sale is made.

"I thoroughly believe in lamp display. In fact I try to have one of my windows devoted to a lamp display all the time. If I neglect to have a lamp window for a week the volume of lamp business noticeably drops off right away. This is true of any appliance displayed. The windows have a very great selling power and we change them often, making them as attractive as we can.

"The new 27-cent price on lamps, too, I think is a very excellent move. Twenty-seven cents is a psychologically good price. It is better than 25 cents would be even, for it seems to hit the right balance between 25 cents and 30 cents."

The Hobrecht company has had some striking lamp displays. Mr. Hobrecht went on to explain that the window drew attention to the lamps, and that those coming in for a lamp were usually sold two or more. This brought up the subject of specials.

The "Teaser" Special that Attracts

"We try to have specials on something right along, just to keep people coming to the store. It need not be on electrical appliances necessarily, although we often feature a special in lamps or something small which we can buy in large quantity and sell very cheaply. We have found that silk tassels for light fixtures have been an excellent teaser to get people into the store. Maybe they did not buy anything than just the advertised article, but we get them in the habit of coming here.

"The same isn't true of larger appliances as specials though," Mr. Hobrecht continued. "When someone comes in to buy a waffle iron at a special price, that is usually all that he buys. The article itself is costly enough so that the buyer feels it is all he wants to go in for at the time. But with smaller articles we can more often sell other pieces of merchandise."

The fixture business, according to Mr. Hobrecht, has been hurt greatly by destructive competition and the tendency of some fixture dealers to sell jobs of fixtures on price rather than on merit or design.

"We used to do a great deal of fixture business. But now we have only one man on it. We can't make it pay in this crazy competition. It ruins it. It used to be that a builder could be sold fixtures on quality. It was worth some time and consideration to design and plan fixture installations. But not any more. An apartment house here recently with 16 apartments, that should have had $1,600 in fixtures was sold a job of fixtures that cost it only $600. The result is that quality has been absolutely sacrificed to price. This branch of the electrical business certainly needs something to stabilize it."

The Hobrecht store is a consistent and persistent user of advertising space in newspapers. It does not favor the special edition or one-time page, but prefers to use regular space and large display space when some special feature is planned. Direct mail also has been used effectively by this company.

In a campaign selling electric thermal jar cookers held during June Mr. Hobrecht sent out several thousand broadsides reproduced from the advertisement run in local papers. These broadsides were used as envelope stuffers by the power companies in the district, co-operating with his store.

Two store windows in Salt Lake City in which daylight window lighting is being used. The reduction of street reflection is noticeable, even in a photograph. A new rate schedule for window lighting extended to daylight hours has increased daylight window lighting twenty-five per cent.

Successful Range Campaign in Wenatchee District.—A successful electric range campaign recently was completed in the Wenatchee district of the Puget Sound Power & Light Company, in which the quota of 175 ranges was topped in a 60-day campaign. The majority of the ranges were sold to ranchers.

Electragist Institute Closes Second Successful Run

The second merchandising institute to be held by the Merchandising Section of the California Electragists, Southern Division, recently has been completed. R. E. Smith, advertising manager of the Southern California Edison Company, speaking on "How, When and Where the Electrical Dealer Should Advertise," and B. A. Graham, California sales representative for the Chicago Flexible Shaft Company, speaking on "Selling Small Appliances," shared the platform.

During the ten-day period between May 24 and June 4 these speakers accompanied by C. J. Geisbush, executive secretary of the California Electragists, Southern Division, addressed interested audiences in the following cities: Glendale, Pomona, Santa Ana, Los Angeles, Compton, Santa Barbara and San Diego.

These meetings are evoking such evident approval that now it is planned to make them a regular part of the Electragists' annual program and to offer such institutes about four times each year. Combined attendance at the institutes this time totaled 225, and it was noted that a larger percentage of contractor-dealers composed the personnel of these meetings than in the previous institute, indicating that the dealers are growing more interested in the idea and are taking advantage of it.

Send Refrigerators Frosted to Customer's Premises

Several progressive merchandisers of electrical refrigerators have adopted a plan of sending the machines sold to the homes of their customers with the refrigeration unit frosted and ready for immediate operation. The Southern California Edison Company has adopted this plan, and in the northern part of California J. C. Hobrecht of Sacramento has found this method successful.

When a shipment of refrigerators arrives Mr. Hobrecht has the machines uncrated and set up for operation upon the floor of his shop. Here the refrigerator is set in operation, and such adjustments and servicing as are required are done on the machine before it is sold or displayed. This method has eliminated much of the early service calls to get a refrigerator in adjustment when first purchased.

When a refrigerator is sold, the machine is put on the line and the unit completely frosted before leaving the store. In this condition the refrigerator remains frosted for several hours, more than enough to allow delivery of the refrigerator to the customer's premises. When it is delivered, it is plugged in on the customer's line and is already cold enough for immediate use as a refrigerator by the housewife.

A service man calls three times during the first ten days of operation of the new refrigerator, making such other minor adjustments as seem necessary. Seldom is any further servicing necessary. One man is kept upon this service work alone.

This plan has proved so successful that it may be worthy of adoption by any dealer selling electric refrigerators.

Radios Stolen from Pasadena Electrical Dealer.—Breaking into the store of the McNally Company of Pasadena last month, burglars stole $700 worth of radio equipment, most of it from the windows of the store. Serial numbers on Radiola sets stolen were: model 26, 205,602; model 25, 114,636; model 25, 120,126. A Radiola III in a portable case, the speaker part of a model 102 loud speaker, the loop of a model 28, and a desk-type Burroughs adding machine also were taken. The above information is given in the hope that some reader of the Journal may be able to assist another reader of the Journal in tracing these losses, and that the Journal in this way may further its service.

The Dalles Wins Range-Campaign Window Prize.—In the campaign being run by the Pacific Power & Light Company for ranges, The Dalles, Ore., office of the company was awarded the $25 prize for best window display in the first part of the contest. The Pasco office was winner of two subsequent contests held later. Toppenish district led in sales of ranges in the contest being held between district offices in competition for the George A. Hughes trophy, presented by the Edison Electric Appliance Company.

Electragists Show Wattage Increases in May.—Reports turned in to the secretary of the California Electragists, Southern Division, show that members of that organization sold appliances in May representing a total wattage of 205,263. Of the special appliance for the month, featured simultaneously by all dealers, 60 were sold, representing increases to the lines in that section of 27,900 watts. Only twenty-two reports were turned in, or from less than a quarter of the membership.

This brings the total wattage of appliances sold since November to 1,678,372.

Winter
is truly the season when you most appreciate—
Electric Refrigeration
Utah Power &
Economy
Not alone through the big savings you make in keeping foods fresh, sweet and wholesome—
Electric Refrigeration
costs less than any other method. Automatic regulation gives you just the amount of cold you require—no more and no less.
Utah Power & Light Co.
Efficient Public Service
Children
Electric Refa
Utah Power & Lig
Now
is the time to install
Electric Refrigeration
Utah Power & Light Co.
Efficient Public Service
Beauty
Electric Refrigeri
Utah Power & Lig
Desserts
that charm because of endless variety, daintiness and exquisite taste are so easy to serve with
Electric Refrigeration
They are easy to mix—then just place them in the pans and serve when ready.
Utah Power & Light Co.
Efficient Public Service

Six of a series of sixteen postcards sent to prospects by the Utah Power & Light Company to educate them in the advantages of electric refrigeration. They were sent out twice a week beginning in January.

NEWS OF THE INDUSTRY

Steam Power Development Studied by A.S.M.E. at Hydraulic Session

Steam power development as applied to systems primarily hydroelectric was the feature subject under discussion at the hydraulic session of the A.S.M.E. Spring Meeting, held at San Francisco June 30. Other technical sessions included a general business meeting, petroleum session, industrial training and educational session, fuels and railroad session, oil and gas power session, and an all-day session on A.S.M.E. boiler codes.

Three papers were presented at the hydraulic session. These papers were as follows: "Aspects of Steam Power in Relation to a Hydro Supply," by A. H. Markwart, vice-president in charge of engineering, Pacific Gas and Electric Company; "Water Power and Steam Power in California Utilities," by H. A. Barre, executive engineer, Southern California Edison Company; and "Speed Changes of Hydraulic Turbines for Sudden Changes of Load," by E. B. Strowger, Niagara Falls Power Company, and S. L. Kerr, Jr., assistant hydraulic engineer, Wm. Cramp & Sons Ship & Engine Building Company.

Economics involved in the water-power versus steam-power question is considered by both Mr. Barre and Mr. Markwart. However, their ideas and points of view differ. Both are agreed that for the most efficient development of water resources a combined steam and hydro program is essential. It is Mr. Markwart's idea that hydraulic power should be developed as fully as possible not only from the power-supply standpoint, but because of the conservation of natural resources effected and the development of and service to rural load centers adjacent to transmission lines. He believes that steam power should be provided and a co-ordinated system built up to effect the best system economy, for stand-by, for meeting the seasonal hydro deficiency during the short-water period on non-regulated streams, and for meeting the dry-year hydro deficiency. Mr. Markwart contends that with major steam power plants power can be delivered at load centers for about eight mills per kw-hr., and with a co-ordinated steam and hydro system for even less than that, considering oil to be as high as $2 per bbl.

Considering oil at $1 per bbl. and with 425 to 450-kw-hr. per-bbl. efficiencies effected at the new Seal Beach and Long Beach steam plants Mr. Barre quotes fuel costs at about 2½ mills per kw-hr. With this condition existing he states that further development of stream-flow hydro plants is practically out of the question and that even projected storage hydro plants must be scrutinized more carefully than heretofore. Mr. Barre states that only an increase of several hundred per cent in fuel prices can change this condition. These last two statements of Mr. Barre's caused much discussion, and the consensus of opinion seemed to be that he was letting the pendulum swing too far in favor of steam development.

In discussion of these papers S. A. Moss, General Electric Company, Lynn, Mass., gave some interesting facts and figures showing the influence of industrial development and demands upon the design and construction of steam plants on Eastern hydro systems. He pointed out that this has made feasible the installation of units of from 5,000 to 15,000 kva., and he voiced the question as to whether or not the industrial development of the Pacific Coast would bring about a similar condition. R. L. Thomas, assistant to general superintendent, Pennsylvania Water & Power Company, criticized Mr. Barre's statements as being extreme and cited numerous factors in favor of a full development of all water-power possibilties. He suggested that steam more properly should be qualified as stand-by for transmission lines rather than for hydro plants. W. L. Abbott, Commonwealth Edison Company, Chicago, and president of the A.S.M.E., in speaking of Mid-West experiences, pointed to the advisability of transporting fuels to centrally located steam plants rather than transporting power over long transmission lines. Discussion and criticism of this statement pointed to the omission of consideration for the development of the territory traversed by such a transmission line.

The paper on speed changes of hydraulic turbines presented a mathematical discussion of the problems incident to the study of that subject as conducted on a 70,000-kw. unit. Methods of determining governor time were noted in the paper, and the relation of generator fly-wheel effect to speed variation was established. This paper was presented by R. S. Quick, of the Pelton Water Wheel Company, who also enlarged upon the mathematical consideration of water hammer and its effects. In discussion of this paper Roy Wilkins of the Pacfic Gas and Electric Company took exception to the assumption of any fixed values of penstock-pressure rise in making calculations. He also stated that a practical solution of the problems of speed changes would be dictated by a proper economic balance between the costs of penstocks and the costs of turbine-generating equipment.

Water and Power Act Gets Enough Signatures for Ballot

The twice defeated Water and Power Act again will find its place upon the initiative ballot in California fall elections. This became a fact June 30, with the filing with Frank C. Jordan, Secretary of State, of petitions containing 82,318 names of qualified electors. This measure is identical with the two preceding measures intended to authorize the state of California to issue $500,000,000 worth of bonds for the development of water for irrigation and hydroelectric power.

The required number of signatures to give a measure place upon the ballot is 77,263. The petition from Alameda County, containing 11,332 names, gave the measure the number of names necessary to qualify. San Francisco names totaled 20,698. In Los Angeles, where the measure was falsely represented as being in support of Boulder dam, 50,288 signatures were obtained.

Preliminary campaign matter prepared by Franklin Hichborn, executive secretary of the California State Water and Power League, sponsoring the Water and Power Act, was in the form of an attack upon the regulation of utilities as carried on by the California Railroad Commission. The commission is criticised in this pamphlet for being an appointive body rather than an elective one. The Water and Power Act provides for the appointment by the governor of a board to develop and distribute water and electrical energy and administer the disbursement of the $500,000,000 the act provides.

First submitted in 1922, the Water and Power Act was turned down decisively by a majority of more than 353,000 votes. Again submitted in 1924, it was turned down by a majority of 432,000 votes. The measure to be submitted in November is identical in wording and form with those defeated in the two previous attempts. Full text of the act was printed in the Sept. 1, 1924, number of the Journal of Electricity, p. 177.

Utility Applies for Franchise in Thurston County, Wash.—Application has been made to the commissioners of Thurston County, Wash., by the Puget Sound Power & Light Company for a 50-year franchise for the installation of poles, wire and necessary equipment for the transmission of electrical energy along various roads in the county.

License Covering Sites on Columbia River Extended.—The license issued by the Federal Power Commission to the Columbia Valley Power Company covering the Pelton and Metolius sites on the Columbia River has been extended for two years. This is done to allow more time in which to develop the market for the power which these developments will bring in.

Agricultural Engineers Discuss Electrification at Lake Tahoe Convention

That any breaking down of system loads into their component parts such as is threatened by numerous municipalities can only result in undoing the progress already made by electric utilities and postpone the day when universal rural electrification will become an accomplished fact was the statement made by L. S. Wing, engineer, California Farm Bureau Federation, before the twentieth annual convention of the American Society of Agricultural Engineers at Lake Tahoe, Calif., June 23-26, 1926. In discussing rural electrification from an economic and engineering standpoint, Mr. Wing told the one hundred seventy agricultural experts representing thirty-one states that only with the economies effected by a highly diversified local load coupled with the further economies which result from interconnection and consolidation in general rural electrification possible.

In discussing the factors which influence rural rates and the extension of rural service he stated that rural service in general cannot be economically justified with such low consumptions per farmer of 300 to 1,000 kw-hr. per year. The only foundation upon which rural electrification can safely rest, he declared, is the sale of energy in quantities which will make the load profitable to both farmer and utility company. Mr. Wing also outlined the development of the rate schedules and line extension policies which have brought about the electrification of 65 per cent of California's farms.

The subject of rural electrification played an important part in the program of the convention. Experts discussed the application of electricity to the poultry industry, to the dairy industry and in orchard spraying. Prof. E. A. Stewart of the University of Minnesota and director of the Red Wing Project, declared that the electric utilities must furnish absolutely reliable service to the poultryman. He also described the recently developed application of ultra-violet rays to poultry for the curing of disease and the promotion of growth.

F. J. Zink, Iowa Community for Electrical Development, in discussing rural line characteristics stated that the utilities and the farmer must select equipment which will give high demand, diversity and power factors if rural extensions are to be profitable. He also warned against the use of home-made appliances which will not meet code requirements and the installation of wiring and equipment by anyone but an expert.

The use of electric power to drive stationary orchard spray rigs in the Wenatchee Valley, Washington, was discussed by Harry L. Garver, Washington Committee on the Relation of Electricity to Agriculture, who pointed out that a study of a number of the orchards served by the Puget Sound Power & Light Company showed that 97 motors aggregating 450 hp., utilized 60,000 kw-hr. during one season and sprayed the orchards at a cost of approximately $2 per acre. More than 1,000 such outfits are in use in that section of the state and over 200 were sold during the present season, Mr. Garver declared.

Under the direction of E. A. White, director, National Committee on the Relation of Electricity to Agriculture, several meetings were held with directors of the various state committees for the purpose of co-ordinating the work in the different states.

One of the features of the post-convention trips taken by the delegates was a tour of the Spaulding-Drum hydroelectric development of the Pacific Gas and Electric Company for the purpose of showing the co-ordination of use of water for power development and irrigation.

Aberdeen Votes Wynooche Bonds and Plans Initial Work

Following the passage at the recent special election of the proposed $2,000,000 bond issue to be used by the city of Aberdeen, Wash., in the development of the Wynooche River power porject as a municipal hydroelectric enterprise (Journal of Electricity, June 15, 1926, p. 589), the council has announced that preliminary work will proceed immediately. The measure passed by a majority of more than 1,000 votes.

The first step in the development will be the purchase of 700 acres of land and the Canyon dam site. Plans for the preliminary development will be presented to the council for indorsement during the next two weeks. A 4-mile railroad will be built at once into the site of the dam. The initial development of the Wynooche calls for the construction of a 115-ft. dam about one-quarter mile from the mouth of the Wynooche Canyon. This dam will raise the water in the canyon and will create a lake about two miles long and slightly less than a half mile wide. Ultimate development calls for a dam 240 ft. high, which will create a lake seven miles long and almost a mile wide at its greatest width. The large lake would flood 2,600 acres. The Wynooche dam site is owned by Mark Reed, and the price has been set at $50,000, city officials state.

Passage of the Wynooche project bonds will not stop the plans of the Grays Harbor Railway & Light Company to develop a $20,000,000 hydroelectric project on the Cowlitz River (Journal of Electricity, June 15, 1926, p. 588), according to W. W. Briggs, vice-president and general manager.

A. E. Cross, former city attorney, who has been a leader in the Wynooche power campaign, states that J. L. Stannard, who was consulting engineer of the Cushman power project, probably will be retained to supervise plans and construction of the Wynooche.

Puget Sound Company's Bremerton Office to Start Building Unit.—The Puget Sound Power & Light Company's district office in Bremerton, Wash., through E. T. Steel, manager, announces that work on the construction of the first unit of new buildings and extensions planned will be started immediately. Plans are now under way. First work will include an addition to the Fourth Street building recently purchased and construction of a large warehouse and garage structure adjoining.

Los Angeles Violated Contract Edison Company Charges

Claiming violation of the power contract given by the city as part payment for the purchase of the company's distributing system in Los Angeles, the Southern California Edison Company June 21 brought suit against the City of Los Angeles and the Board of Water and Power Commissioners asking for an injunction to stop the operation by the Bureau of Power and Light of three diesel engine electric generating plants now being operated by the bureau, two in the San Fernando Valley and one near Slauson Avenue and Western Avenue.

The complaint recites the terms and conditions of the power contract executed by the city under which for a period of ten years from May 16, 1922, the city agreed to buy from the company all of the electric energy and power necessary to furnish the city and its inhabitants all of the electricity needed or required over and above the amount produced by the city at its own hydroelectric plants.

The complaint then charges that, notwithstanding the foregoing facts, the defendants now are producing and generating and turning into the city's distributing system and delivering to consumers for use within the limits of the city electric energy and power over and above the electric energy generated at the city's hydroelectric plants. The additional generation is from certain fuel generating plants located within the city near the intersection of Lankershim Boulevard and the Coast line of the Southern Pacific Railroad that consists of three oil-burning diesel engines each directly connected to an electric generator and a similar plant located near Slauson Avenue and Western Avenue, capacity of these plants being not less 5,000 kw.

The expenditures of public moneys in producing and generating electric energy and power through the operation of the fuel generating plants referred to and in turning such electric energy and power into the distributing system of the city and supplying it to consumers within the limits of the city "constitutes and will continue to constitute illegal expenditures of and a continued waste of public funds" of the city, the complaint alleges.

It goes on to state that it is necessary for the court to enjoin the defendants from performing the acts complained of in order to prevent a multiplicity of suits by the Edison company, as those acts "constitute a continuing breach of the city's obligations under the said purchase agreement and are causing plaintiff a continuing loss and damage and also are resulting in a continuing misapplication and illegal and wasteful expenditure of the public funds of the city. If the continuance of such acts is not enjoined by this court, it will be necessary for plaintiff to institute numerous and sucessive actions against the city to recover such loss and damage as the plaintiff from time to time sustains and is able to prove, and also numerous and successive actions against the members of said Board of Water and Power Commissioners of the City of Los Angeles, and other city officials, personally, to restore to the city treasury the public moneys and funds being illegally and wastefully expended as hereinabove alleged."

Advertising Men Feature Utility Sessions at Convention

Advertising by public utility companies, especially in combating the repeated inroads attempted by public-ownership advocates, proved to be the subject of much discussion following a number of excellent papers presented at the public utilities departmental during the twenty-third annual convention of the Pacific Coast Advertising Clubs Association, held in San Francisco July 5-8. Public-utility advertising men also played an important part in the general activities of the convention.

At the first departmental, July 6, Ben S. Allen, public-utility advertising consultant, in speaking on "What Shall We Advertise; Is Courtesy and Service Enough?" urged the public utility to get away from its "inferiority complex." He said that too much emphasis on courtesy and service catered to the dishonesty and discourtesy of patrons and that some positive fighting for its own rights is necessary for each utility. He decried the practice of "whining" and said that a utility could tell the public its difficulties without whining. Services of a power company, he said, were no different fundamentally than merchandise of any other sort and must be sold soundly.

Capt. Norwood W. Brockett, director public relations, Puget Sound Power & Light Company, Seattle, gave a powerful presentation of the forceful arguments which must be carried on in "Combating Public-Ownership Propaganda with Advertising." He urged that even those companies not now threatened with public-ownership propaganda advertise the advantages of customer-owned utility operation under sound business management to acquaint the public with the advantages of the latter and forestall ignorant and misleading outcroppings of the public-ownership idea.

Carrying on similar thoughts and showing the new conception of ownership as the true public ownership, Al C. Joy, advertising and publicity director, San Joaquin Light & Power Corporation, Fresno, Calif., spoke on "Customer-Ownership as a Financial and Political Stabilizer." He outlined the history of customer-ownership and detailed the part played by advertising in making it successful.

Clinton S. Reynolds, supervisor public relations, Tacoma Railway & Power Company, was the last speaker on Tuesday afternoon, speaking of "Unworthy Advertising Media" and urging a unified stand in respect to them.

Mrs. Kate Brew Vaughn, director of home economics, Los Angeles Evening Express, and responsible for that paper's large home economics display and lecture room, told what women wanted to know of electrical merchandise by means of the advertising of the manufacturers at the second session, Wednesday. Her subject was, "Women as Purchasers of Trade-Marked and Nationally Advertised Goods." The influence of women in buying, she said, was overlooked. More than 85 per cent of all family purchasing is done by the woman, and she influences the other 15 per cent, Mrs. Vaughn said. She plead for the giving of real information in appliance advertising, showing what qualities in merchandise women demanded.

"The How, What, When and Why of Telephone Advertising" was analyzed meticulously and completely by W. J. Phillips, assistant vice-president, Pacific Telephone & Telegraph Company, San Francisco.

D. L. Scott, manager public relations, Los Angeles Gas and Electric Corporation, with a clever and provocative paper, "Some Sacred Cows of Advertising," described some of the major wastes in advertising appropriations due to faulty plan, careless handling of details, and special advertising pages or editions, novelties and the like. He urged that the departmental adopt the stand taken by the Advertising-Publicity Section of the Pacific Coast Electrical Association in its book of standards against such media. Mr. Scott was awarded the prize for the best paper presented in the public-utility departmental.

The trophy for the best display of advertising from a public-utility company was won by the Los Angeles Gas and Electric Corporation for its extensive display of advertising made in conjunction with the convention.

Other utility men were prominent in the convention affairs. A. C. McMicken, sales manager, Portland Electric Power Company, and president of the Portland Advertising Club, was active in getting the next convention of the P.C.A.C.A. for Portland, Ore. W. P. Strandborg, Portland Electric Power Company, and chairman of the public utilities departmental, was recommended for a second term. He was unable to attend the San Francisco convention.

Utility Erecting 33,000-volt Line Between Thorp and South Cle Elum, Wash.—The Puget Sound Power & Light Company has undertaken work of planting poles along the 27-mile power line between Thorp and South Cle Elum, under V. P. McNamara, resident manager of the company in Ellensburg, Wash. The power line will carry 33,000 volts. It will parallel the high line canal from South Cle Elum and will furnish power to the irrigation districts in that section.

Fifth Power House on Big Creek Project to Be Begun

Work is to begin at once on the construction of the fifth power house on the Big Creek-San Joaquin project of the Southern California Edison Company. This new power plant is to be known as Power House No. 2A and is to be built immediately adjacent to the present power house No. 2.

Operating at a hydraulic head of 2,420 ft., the highest head of any of the plants on the Edison company's system, the new plant will have a generating capacity of 112,000 hp.

There are to be two 45,000-kva. horizontal generators, each of which will be driven by a double-overhung impulse-type turbine. The Westinghouse Electric & Manufacturing Company is building the two generators, which are the largest horizontal water-wheel generators ever built. The Pelton Water Wheel Company is furnishing one of the water wheel units and the Allis-Chalmers Manufacturing Company the other. Each of the water wheels will have a rated capacity of 60,000 hp. The normal speed of the two units will be 250 r.p.m., and they will generate at 11 kv., which will be stepped up to 220 kv. before transmitting. Each of the complete generators will weigh in excess of 300 tons. (Journal of Electricity, April 1, 1926, p. 276.)

In the matter of entering the penstock into the plant the company is departing from normal procedure radically. It has been customary to have the penstock extend to the level of the floor of the power house and then by means of an ell level out and enter the plant. Power house No. 2A is to be so close to the side of the hill upon which the penstock is to lie that it is planned to have the penstock enter the power house directly without passing through an ell. This will tend to increase efficiency and greatly simplify penstock construction.

Completion date has been set tentatively for early in 1928.

"A man's home is his castle." So's this kiddies' playhouse built for his small daughters, Clara and Alice, by G. H. P. Dellman, lighting sales engineer of the San Diego Consolidated Gas & Electric Company. It will be noted that the home carries the Red Seal, nor is this a comedy touch. The "homelet" here shown is entirely up to Red Seal specifications, and the fact that it is a vest-pocket affair makes no difference. It is completely wired throughout, equipped with daylight lighting units, and contains the prescribed quota of convenience outlets. An electric grill, ovenette, toaster and waffle iron are included in the home's furnishings, and at times these are augmented by various other electric appliances "lifted" when mother isn't looking. It is a family rule that when an appliance has not been used in the Dellmann home for a period of thirty days the children may carry it off to the playhouse for keeps. At the housewarming the girls served an electrically cooked luncheon for the family and several guests.

New Substation of Great Western Company Put in Operation

An important addition to the distribution system of the Great Western Power Company has been made in the placing in operation of the company's new Grand Island substation near the town of Ryde, Calif. The substation was constructed at a cost of more than $200,000. It will supply an important load for irrigation, reclamation and general farm use in that agricultural region.

The switch gear and voltage regulation apparatus are all automatic in operation. Transformers installed have a capacity of 9,000 kw. The substation will also serve to tie the Grand Island and Antioch substations. The substation is connected to the company's Brighton substation.

Exchequer Plant Formally Opens When Coolidge Presses Key

With a ceremony climaxed by christening of the power house by dropping of Merced water 300 ft. to the roof of the plant from the top of the dam, and the generators set in motion by President Coolidge, in Washington, D. C., pressing a key, the Merced Irrigation District celebrated the completion of the Merced-Exchequer project June 23. A crowd of 1,500 agriculturists, civic leaders and notables attended the ceremony and heard read messages of congratulation from President Coolidge and Secretary Hoover. C. C. Young, lieutenant-governor of California, U. S. Webb, attorney-general of California, and Richard Shaffer, president of the Merced Chamber of Commerce, were the principal speakers.

Exchequer dam is located 35 miles east of the city of Merced on the Merced River. The dam is 330 ft. high with a crest length of 955 ft. The power house is located at the foot of the dam and contains two turbines, capable of generating 42,000 hp. Relocation of 17 miles of railroad line to the Yosemite Valley was necessary in the consummation of the project, necessitating one of the highest railroad spans in the country at one point where the railroad traverses the lake formed by the dam.

The entire output of the power plant will be absorbed at the switchboard of the Exchequer power house by the San Joaquin Light & Power Corporation, Fresno.

Los Angeles Power Bureau Plans 47,000-hp. Development

Plans now are being worked out by the Los Angeles Bureau of Power and Light which will provide for the development of 47,000 hp. of additional hydroelectric energy in existing Owens River power plants as one feature of a great construction program for the bureau's electric system, according to a statement which has just been submitted to the water and power commission by E. F. Scattergood, chief electrical engineer.

The work now contemplated, stated Mr. Scattergood, is in line with the power bureau's plans as worked out when the Owens River aqueduct water and power project first was launched. Generation of hydroelectric energy along the aqueduct, he pointed out, necessarily is dependent on the volume of water passing through the aqueduct. Year by year this volume has been increased to meet the growing needs of the city, and, as this volume of water is increasing, additional power development opportunities are presented.

"In connection with the development of this additional block of 47,000 hp. of energy, it also will be necessary for the bureau to construct a large new reservoir just above the present plant No. 1," Mr Scattergood explained. "This reservoir will be situated near the present Fairmont reservoir and will be known as the Elizabeth Lake Reservoir. It will be used to regulate the flow of water through the generating plants immediately below."

In the city itself the bureau is at present working on a high-voltage transmission system which when completed will circle the city. It is planned to construct two new substations on this belt line, one at Central Avenue and 95th Street, and the other in the harbor district.

West Coast Power Company Sold to W. B. Foshay Company

The properties of the West Coast Power Company, Portland, control of which passed about six months ago from A. Welch, then president, to Cammack & Company, Chicago, recently have been purchased by the W. B. Foshay Company, Minneapolis, of which A. Welch is Western manager. According to a statement issued by the purchasing company, the West Coast properties will be consolidated about Aug. 1 with other properties in eight states owned and operated by the Peoples Light & Power Corporation, Minneapolis, while the management will remain with the Foshay company. The physical valuation of the properties included in this consolidation is about $8,000,000, and the gross earnings exceed $1,000,000.

The West Coast Power Company is a little over a year old and has expanded substantially since its organization. (Journal of Electricity, April 1, 1925, p. 258.) It now serves the following towns in Oregon: Reedsport, Gardiner, West Gardiner, Florence, Glenada, Cushman, Waldport, Toledo, Newport, Yaquina, Clatskanie Junction, Westport, Quincy, Cascade Locks and Burns; and the following in Washington: Shelton, Cathlamet, Stevenson, Chinook, Ilwaco, Long Beach, Seaview, Ocean Park, Nahcotta, South Bend, Breakers, Newton, Tioga, Centerville, Shelbourne and Holman.

Ernst Jacobson, who was president under the Cammack ownership, now has resigned. S. J. Keys is general manager.

Northwest High School Boy Wins Westinghouse Scholarship

Among the four winners out of fifty-two contestants in this year's War Memorial Scholarship conducted by the Westinghouse Electric & Manufacturing Company was F. Munro Redman, son of Frank M. Redman, sales representative of the Westinghouse company, Portland. Young Mr. Redman is the first successful contestant from the Northwest and the second from the Pacific Coast since this scholarship was established by the company to commemorate the war service of its employees.

Each year the company offers the equivalent of college entrance examinations to applicants among the sons of employees, of college age, or among employees under a certain age, and grants to the four highest an annual payment of $500 for four years in any university the winners choose.

Mr. Redman, who graduated from Grant High School, Portland, in June, has elected to study electrical engineering at Stanford University, Palo Alto, Calif.

Delco Light Adds $20,000,000 Plant Extension

Twenty million dollars will be expended within the next six months by the Delco Light Company in the expansion of its Frigidaire division at Moraine City, some four miles from Dayton, Ohio, it was announced by E. G. Biechler, president and general manager of the company. This expansion has been caused by the company's electric refrigerator business outgrowing the existing manufacturing facilities in the city of Dayton.

With the new plant the Delco Light Company will have a production capacity of 600,000 electric refrigerator units a year, more than doubling its present output. Manufacturing equipment will be installed which will enable the company to turn out Frigidaire units at the rate of four a minute. Approximately 36 acres will be added to the factory space of the company, making a total of 68 acres.

The enlargement of plant facilities provides only for estimated production needs for 1927, according to Mr. Biechler. This is only the beginning of the $100,000,000 expansion program which the General Motors Corporation will put through if necessary to meet the demand for household and commercial Frigidaire electric refrigerators.

At the company's Taylor Street plant in Dayton the production of farm-lighting plants and water systems will be continued, and a total of 1,000 commercial refrigerator units can be produced per day. At the Moraine plant all facilities will be turned to the household refrigerator and the production of cabinets.

The decision to go ahead with this expansion program was made only after a careful survey of the potential market for household and commercial electric refrigerators in the United States which the Delco Light Company estimates as 16,000,000.

The two plants of the company have been working to their utmost capacity for some time. A new production mark was set in May, when 7,000 men working in double shifts crowded 3,600 man-weeks of overtime into the month. Company products during that month with a retail value of $11,250,000 were shipped away in 623 freight cars.

Substation Being Erected at Moyie, B.C.—The Consolidated Mining & Smelting Company of Canada is erecting a substation at Moyie, B.C., from which it will distribute current provided by the East Kootenay Power Company to individuals and for street-lighting purposes. The Consolidated company recently completed a 500-ton concentrator at Moyie to treat the old waste dumps and the tailings of the St. Eugene mine mill, which was burned several years ago.

News Briefs

Great Western Power Company of California Seeks to Purchase Napa Valley Electric Company.—Application has been made to the California Railroad Commission by the Great Western Power Company, San Francisco, for permission to purchase all the outstanding common stock of the Napa Valley Electric Company, St. Helena, Calif., according to J. B. Black, vice-president and general manager of the former company. The purchase of the Napa Valley company would add to the Great Western company's system the towns of St. Helena, Oak Knoll and Rutherford and contiguous territory, all in Napa Valley. Electric energy is sold wholesale to the California Telephone & Light Company for distribution in Calistoga, and one of the most important retail consumers is the Veterans' Home at Yountville.

Successful Customer-Ownership Campaign Staged by Washington Company.—Sale of more than $2,000,000 in its new 6½ per cent cumulative preferred stock in ten weeks is reported by The Washington Water Power Company, which resumed its customer-ownership program on April 7. The first block of $1,500,000 was sold out within a short time and a second block of the same amount was authorized. (Journal of Electricity, May 15, 1926, p. 493.) Altogether 1,758 stockholders have been added with the new stock, which has a par value of $100, and about $1,063,000 has been paid in cash on the subscriptions, according to W. H. Ude, director of public relations for the Spokane company.

Power Company Plans Transmission Line from Manteca to Salinas, Calif.—The Sierra & San Francisco Power Company (Pacific Gas and Electric Company, lessee) has applied to the California Railroad Commission for authority to construct a 104-kv., single-circuit power transmission line from the Pacific Gas and Electric Company's substation at Manteca, San Joaquin County, to Salinas, Monterey County, by way of the Santa Clara Valley and Pacheco Pass, at an estimated cost of $598,600.

Seattle's Light Department Plans Erection of Ten-story Building.—The municipal light department of the city of Seattle plans the construction of a ten-story building on Third Avenue and Spring Street, which will cost approximately $1,000,000 and will house the offices of the city light department and a substation, expected to cost $500,000 of the above sum. J. D. Ross, superintendent of lighting, and Glenn Smith, chief engineer, now are preparing plans for the structure, which will be erected within the next year. Another central station is of vital necessity, Mr. Ross states, to supply current for the downtown property recently contracted for. The light department offices now occupy scattered quarters.

Stockholders Vote to Sell Power Plant and System at South Bend, Wash.—The Willapa Power Company, South Bend, Wash., at a recent stockholders' meeting voted to sell its plant and system to W. B. Foshay & Company of Minneapolis for a cash price of $110,000. It is rumored that the new owners will connect with the large power development on the Cowlitz River now under way by the Federal Traction & Power Company. The Foshay interests also have an option on the power plant of the Ilwaco Light & Power Company of Ilwaco, Wash. The Willapa Power Company was organized twelve years ago by residents of South Bend to furnish the city with light and power in opposition to the South Bend-Raymond Electric Company whose service was considered unsatisfactory.

Contract has been signed by the Graybar Electric Company leasing offices in what will be the largest office structure in the world, to be known as the Graybar Building. The new building will be located adjacent to the Grand Central Terminal, facing Lexington Avenue and situated between 43d and 44th Streets, New York. It will occupy over an acre and a half of ground and will be ready for occupancy May 1, 1927. It will house the entire New York executive offices and staff of the Graybar company. The new building will be thirty stories high. Sloan and Robertson are the architects, and the engineers and contractors for the project are Todd, Robertson, Todd, of New York.

Endorses Installation of Uniform Lighting on Pasadena Street.—The Colorado - Lake Avenue Improvement Association, Pasadena, Calif., has passed resolutions endorsing the installation of a uniform lighting system for the entire length of Colorado Street. Projects for the widening of Colorado Street are under consideration, and it is planned to install the new ornamental lights coincident with the other improvement work.

Pasadena, Calif., Plans Installation of 1,000 Light Standards.—Installation of 1,000 ornamental light standards during the fiscal year 1926-27 is the program of the Municipal Light and Power Department of Pasadena, Calif. For the fiscal year just ended 964 ornamental standards were installed, according to E. L. Bettanier, engineer of the department. Pasadena now has 2,800 ornamental lights in use, according to the report.

Power Lines in Northern Idaho to Be Connected with Lines in Washington.—The power lines of the Grangeville Electric Light & Power Company in northern Idaho will be linked with those of the Pacific Power & Light Company in Washington, officials of the latter company state. A power line 18 miles long will be constructed from the east end of the Yakima-Walla Walla system of the Pacific company to run from Lapwai, Idaho, to Reubens, Idaho. It will cost $50,000. A substation will be built at Cul de Sac.

Imperial Valley Company to Acquire Yuma Company.—Yuma Light, Gas & Water Company has been authorized by the California Railroad Commission to sell and transfer an electrical distributing system located in Winterhaven and vicinity, Imperial County, to E. J. Condon and David O. True, who in turn are granted authority to transfer the franchise and electrical distributing system to the Imperial Valley Electric Power Company. Imperial Valley Electric Power Company has been authorized to acquire the electric system and to issue on or before Oct. 1, 1926, $2,000 of common capital stock in full payment therefor.

Northwestern Company Permitted to Appropriate Additional Water from Elwha River.—Permits authorizing the Northwestern Power & Light Company of Port Angeles, Wash., to appropriate an additional 200 sec-ft. of water from the Elwha River for electric development and to store additional water in the Glines Canyon reservoir have been issued by R. K. Tiffany, state supervisor of hydraulics. The company now holds the right to appropriate 800 sec-ft. of water from the stream and to store 50,000 acre-ft. in the reservoir. Total development cost is placed at $1,000,000 and the estimated capacity of the proposed plant is 16,000 hp.

Puget Sound Company Prepares for Expansion of Baker River Project.—Planning the expansion of its present power site holdings on the Baker River project, the Puget Sound Power & Light Company has filed application with the state hydraulics office, in Olympia, Wash., for an additional 140,000 acre-ft. storage reservoir near the present holdings to be built at a cost of $100,000 during 1928-29. Submerging a total of 2,255 acres to a depth of from 80 to 255 ft., the new reservoir will have a concrete dam heading 275 ft. high. Across the top of the dam will be 23 spillways, each having a width of 10 ft.

Half Moon Bay Line to Be Transferred to Pacific Gas and Electric Company.—Great Western Power Company of California has applied to the California Railroad Commission for authority to sell and Pacific Gas and Electric Company to purchase an electric transmission line between San Gregorio and Pescadero, San Mateo County, for the sum of $54,047.67. The transmission line, which is about 11½ miles in length, plus laterals, is being transferred to Pacific Gas and Electric Company in pursuance of an agreement between the utilities whereby duplication of facilities will be eliminated in this territory.

News of the Electragists

Electragists Outline Progress and Plan for Future at Meeting

Progress reports and constructive planning for the future marked the fourth quarterly and the first annual meeting of the California Electragists, Southern Division, that was held at San Diego, June 26, as one of the milestones in the history of the organization.

Executive Committee Report

The morning session was called to order by President Harry Walker of Los Angeles at 9:45 a.m. with over 100 delegates in attendance. Mr. Walker read the report of the executive committee. This included a brief history of the organization followed by the work of the committee. The two major problems considered were: First, better jobber relations obtained through the work of the trade policy committee. This included twenty-seven meetings with the jobbers. Second, the securing of better co-operation between the credit and sales departments of the jobbers. This phase of the problem included: (a) a better classification of accounts of those entitled to purchase; (b) opening new outlets in saturated territory; (c) selling consumers direct, and lamp and fuse contracts between jobbers and industrials; (d) the position of the electragist as a buffer between the industry and the various electrical departments and the building industry; and (e) a credit accounting system. In discussing the subject of better bookkeeping and accounting systems the executive committee called attention to the fact that the contractors as a group are weak and that this phase of their business should be improved upon. The committee felt that electrical jobbers should demand a financial statement from a contractor before extending him credit the same as a bank does before it extends financial credit. It stressed the fact that opening new accounts in a district that is adequately served is unwise. The evil of selling a customer's customer in any business was pointed out. The national trade policy of the electragists was reiterated as: manufacturer to jobber to contractor-dealer to consumer. The electragists do not object to a jobber selling to industrials which maintain a regular electrical department, but they do object to this practice in cases where the work ordinarily would be done by a contractor. The fairness and broad viewpoint of the electragists again were shown when contractors were requested to practice the announced policy of distribution.

An informal discussion on the lawn: from left to right—R. I. Carruthers, Southern California Edison Company; R. F. Doll, electragist of Glendale, and R. M. Fry of Los Angeles.

Motor Section

The report of the recently organized motor section was made by Warren M. Thorne of Norton & Norton, Los Angeles.

Estimators Section

R. L. Booth, The English Company, Los Angeles, gave the report covering the activities of the estimators' section. He outlined the history of the organization as being an outgrowth of one of the lessons in estimating which was given to the Los Angeles Electrical Contractors and Dealers Association by C. J. Geisbush. The organization meets at the office of the Los Angeles Association every Thursday noon. Estimating methods and comparative time studies are being conducted by members. The estimating system of the Association of Electragists, International, has not been adopted by the organization, but it is being used by a number of the members and the results are being compared with those obtained by other methods. A committee to work with architects has been appointed which is endeavoring to have the electrical plans completely laid out and then have sufficient time allowed to estimate them properly. In one particular job studied containing some 45,000 ft. of ½ and ¾-in. conduit, the difference in estimates amounted to 30 per cent. In such a case the low man might add 20 per cent to his estimate and still be lower than the man with a correct estimate who put in his bid at cost.

Merchandising Section

O. N. Robertson, Robertson Electric Company, Santa Ana, presented the report of the merchandising section. In his report Mr. Robertson stated that the future volume of business in the electrical industry must come from an increase in the sale of labor-saving devices in the home rather than from electrical installations in large office buildings and similar structures. In speaking of the merchandising institutes he stated that the first one consisted of seven meetings held in various cities and was attended by 350. The second was attended by 225; although attended by a smaller total number, a greater number of those present were contractor-dealers. One specific result consisted of an electragist selling a building containing 165 apartments so that it would conform to the Red Seal specifications, basing his sales talk on that presented at the institute. The electrical estimate on this job was increased from $14,000 to $27,000. The committee expects to continue the institutes at intervals of about three months; to be successful, however, they must receive the support of the industry.

Contact obtained with other branches of the industry has been valuable; further contact is necessary as all four

Part of the reception committee of San Diego electragists: left to right—Fred Edwards, O. W. Karl, Mrs. J. F. Zwiener, J. F. Zwiener and C. C. Clardy.

The electragists' baseball team which so well defended the honor of the organization by defeating the jobbers and manufacturers' team in the game at Balboa Park.

A large number of women were in attendance at the fourth quarterly meeting of the California Electragists, Southern Division, as evidenced by this picture taken at Balboa Park following the baseball game and lunch.

branches of the industry must work together to get the desired results. Major problems before the industry which must be solved this year include: time payment plans; service; number of lines of merchandise to be handled; full list price in effect by all branches of the industry. Reasons advanced for the contractor-dealer being a poor credit risk included figures gathered nationally which showed that the overhead in business was from 35 to 38 per cent, figures higher than most of the discounts prevailing in the industry to contractor-dealers. It was stated that overhead would have to be reduced or discounts increased.

The contractor-dealer has the first contact in the home; he then has an opening to sell the lighting fixtures; then the appliances, water heaters, refrigerators, and his service. Wide opportunities thus are offered to the live contractor-dealer.

R. I. Carruthers, assistant sales manager, Southern California Edison Company, stated that the power companies want to co-operate with the electragists, and urged that any complaints be taken up direct with the company concerned so that the difficulty might be corrected. He stated that a definite need existed for a uniform range wiring layout, and expressed the hope that this would be forthcoming in the near future.

An interested group of spectators watch the ball game. Harry Walker is holding extra ammunition. Helen Mikesell, executive secretary of the Los Angeles Electrical Contractors and Dealers Association, E. O. Flagg and Perry Mortinson, both of Santa Barbara, are seated on his left. J. E. Cope of Santa Ana is standing behind him.

Afternoon Session

The Red Seal Plan was discussed at the afternoon meeting by H. E. ("Shorty") Sherman, Illinois Electric Company, who is chairman of the Red Seal program in the Los Angeles district. He stated that selling the idea of the Red Seal Plan was the most important problem before the industry, and that one of the most effective methods of putting this over was for everyone in the industry first to become familiar with the plan and its possibilities. He said the Red Seal is an additional talking point for the builder; architects when properly informed also desire it.

P. L. Booth, Edison Electric Appliance Company, reported on the last meeting of the Advisory Committee of the California Electrical Bureau. He stressed the importance of the success of the Red Seal program and of an increase in membership in the electragists' organization.

Other speakers at this session included Rollin Smith, Rollin Smith Engineering Company, and L. J. Penn, National Automotive and Electrical School, both of Los Angeles.

Members' Meeting

The members' meeting was held immediately following the general session in the afternoon. Officers of the Southern Division were re-elected unanimously as follows: president—H. H. Walker, H. H. Walker Company, Los Angeles; vice-president—Frank McGinley, Harbor Electrical Company, Wilmington, and secretary-treasurer—C. W. Jones, Pomona Wiring & Fixture Company, Pomona.

C. J. Geisbush, executive secretary, reported on his work for the year.

Entertainment

Approximately two hundred delegates made the trip to San Diego aboard the Ruth Alexander, leaving Los Angeles harbor Friday night. Dinner and dancing were enjoyed after leaving port. The boat was met Saturday morning by buses which had been provided to take the party to the Hotel San Diego. During the morning sessions the ladies were taken on a sightseeing trip to interesting landmarks in the vicinity of the city.

The annual baseball game between the electragists and the jobbers and manufacturers was held at Balboa Park; following the game a box lunch was served.

The banquet and ball were held in the Pompeiian Room of the Hotel San Diego, Saturday night. They were attended by more than 200.

Book Reviews

ELECTRICAL ENGINEERING

By L. A. Hazleton, M.E. (Stevens), Professor of Electrical Engineering, Stevens Institute of Technology; Fellow A.I.E.E.; Member American Society of Mechanical Engineers; Fellow Institute of Radio Engineers; Fellow American Physical Society. Published by The MacMillan Company, 1924; 625 pp.; 364 illustrations.

This textbook is a concise treatment of the various elements of electrical science and of its application to the various branches of electrical engineering. It is based on the text given to the author's classes in electrical engineering at Stevens Institute of Technology. Accurate presentation of each branch, together with the novel method of treatment as well as clear-cut explanation and figures, results in a text which should be of great value for college study.

Contrary to the method advocated by some authors of similar books the electron is not introduced at the beginning of the text. Instead the first chapter is devoted to the basic ideas of physics which underlie all branches of engineering. The concept of energy is given outstanding prominence, and mechanical force is introduced as the space rate of energy. According to the author, this is done for three reasons. First, because he believes that this is the true philosophical basis for the idea of force; second, because of its analogy to the method of introducing voltage and magnetomotive force; and third, because it is this definition of force that is directly applied in subsequent chapters to calculate all electrostatic and electromagnetic forces.

The second chapter goes into the subject of electric conduction followed by chapters on electrostatics and electromagnetism. Here the method is followed of first presenting the basic experimental facts and then introducing the physical conception of these facts to develop concise laws and to apply these laws to specific problems. Chapters five and six treat alternating currents and transient currents and electric waves. The next chapter, which treats of conduction in gases and electrolytes, is a brief explanation of this most modern branch of electrical engineering. The vacuum tube and its principal applications is presented in a clear-cut and brief but thorough manner. From this chapter the book takes up the discussion of engineering apparatus treating electrical measuring instruments, direct-current machines, synchronous machines, induction machines, and transformers and concluding with chapters on transmission, distribution and electrical communication systems.

To add to its value as a text book typical problems are given throughout. Mention should be made of the excellent diagrams and drawings which are used and which should add materially to the value of the book, both from the standpoint of class-room study and as a reference book for practicing engineers.—E.R.S.

SUPERHEAT ENGINEERING DATA

A handbook on the generation and use of superheated steam and related subjects. Sixth edition revised. (Superseding "Data Book for Engineers"). Bound in keratol, 4½ x 7 in. 208 pages. 85 illustrations and diagrams. 69 tables. The Superheater Company, New York and Chicago, 1925. $1.

In this handbook the authors have endeavored to condense for ready reference the data most frequently desired by steam power-plant engineers and operators. One of the features which makes this handbook quite easy to use as a reference book is the 16-page index which is both complete and a cross index. Superheated steam, its advantages over saturated steam, and the proper design and performance of superheaters are discussed briefly. Typical superheater arrangements for practically all stationary, marine and locomotive type boilers commonly used in America are illustrated. Superheaters for special services, such as conserving waste heat, for separate firing, and those of a portable type also are shown. Comparative data concerning sizes, tube sizes, arrangements of tubes and related data for stationary watertube boilers also are covered briefly. The steam tables given cover pressures from below atmospheric to 600 lb. absolute and include the properties of superheated steam, from 50 to 300 deg. F. superheat.

Information for figuring piping for the handling of water saturated in superheated steam, velocity and pressure drop of water and steam flowing through piping, is covered in the section on piping. Proposed American standards for high pressures also are included in this section. Tables of heat values for gaseous, liquid and solid fuels are included in the engineering data on coal and oil-fired boilers. Complete conversion tables and data on bolt and screw threads combining the recent work of the American Engineering Standards Committee and the National Screw Thread Commission are included among the miscellaneous data given in this handbook. Also there is a collection of miscellaneous tables frequently used by steam engineers.

ALTERNATING CURRENTS AND TRANSIENTS

By F. M. Colebrook, B.Sc. (Lond.), D.I.C., A.C.G.I., Assistant in Wireless Division, National Physical Laboratory, Middlesex, Eng. First edition, 1925, 195 pages, 97 illustrations, 6 x 9 in. McGraw-Hill Book Company, Inc., New York. $3.

This book is intended for the use of students of applied electricity and has been prepared for the purpose of providing such students with a useful mathematical equipment for the solution of many of the theoretical and practical problems likely to be encountered in the study and practice of the subject.

The rotating vector method used throughout the book is the result of the author's attempt to clarify and harmonize the methods and nomenclature of pure vector analysis developed by Heaviside, Gibbs and others with the rotating vector method. His experience has shown that the introduction of the terms "imaginary" or "complex" into what are essentially real and simple operations is a hindrance rather than a help to the student when this method of analysis first is considered.

Chapter 1 takes up vectors and vector operators, followed by Chapter 2 on the scaler product of vectors, and variable vectors. Then follows the application of vector analysis to alternating currents, with which are linked chapters covering problems involving distributed capacity and inductance and damped electric oscillations. Chapter 7 treats the application of vector analysis to the theory of alternating currents of irregular wave shape. The book concludes with a chapter on symmetrical polyphase systems.

This text should be of considerable value to advanced students in electrical engineering. Examples and answers to examples at the end of each chapter also should be quite valuable. A rather complete bibliography dealing with vector analysis is presented at the end of the book. E.R.S.

COMING EVENTS

Association of Electragists, International—
Annual Convention—Cedar Point-on-Lake-Erie, Sandusky, Ohio
Headquarters—The Breakers
Aug. 24-27, 1926

Electrical Supply Jobbers Association, Pacific Division—
Annual Convention
Empress Hotel, Victoria, B. C.
Sept. 7-9, 1926

American Institute Electrical Engineers—
Pacific Coast Convention, Salt Lake City, Utah
Sept. 7-10, 1926

Rocky Mountain Division, N.E.L.A.—
and
Colorado Public Service Association—
Joint Convention, Glenwood Springs, Colo.,
Sept. 13-16, 1926

California Electragists—
Annual State-wide Meeting—Hotel Del Monte
Del Monte, Calif.
Oct. 1-3, 1926

CONNECTING AND TESTING DIRECT-CURRENT MACHINES

By F. A. Annett, assistant editor of Power, and A. C. Roe, industrial and insulation engineer, renewal parts engineering department, Westinghouse Electric & Manufacturing Company. First edition, 1925, 237 pages, 172 illustrations. McGraw-Hill Book Company, Inc., New York. $2.50.

Reconnecting d.c. machinery is a subject upon which little has been written. This book constitutes a welcome contribution to that field. Two distinct parts comprise the book. One part deals with the reconnection of d.c. machinery to accommodate a change in voltage or speed or both. The other part covers the locating and remedying of faults.

Rules and principles governing the changes made in windings to accommodate new conditions are treated in the first section. What is of even more importance to the practical worker is the explanation of the methods of applying these rules. Actual reconnection problems are treated and many wiring diagrams are given. Discussions on types of windings, taking armature rewinding data, types of armature coils, reconnections and changes, and the computation of new windings for old machines follow in logical sequence.

Problems incident to the location and correction of faults are treated in the second section. The subject is treated not only from the practical side to show how tests are made, but the reasons for certain definite test methods are given. Care is taken to explain why certain results may be expected. Standard diagrams are used for illustrations. Short circuits, open circuits, grounds, and reversed coils are treated in separate chapters. Other chapters are devoted to the construction and use of an armature-testing magnet, field-coil checking, and field-coil faults. E.R.S.

Turbines. Serial report of the prime movers committee of the Technical National Section, N.E.L.A. This is a delayed report of the 1924-25 committee. It is a review of the characteristics of the outstanding turbine installations made during that year, and uses the review as a basis upon which to evaluate present-day tendencies in turbine design. Investigation is made into the costs of the special designs of turbines and the allocations of these costs.

Possible modification in design that would increase ratings and tend to reduce turbine costs are pointed out. Statements are included concerning the operation of several specific installations of turbines, including the mercury vapor units at Hartford, Conn., and eight large turbines in Paris, France.

Meetings

Edison Employees at Long Beach, Calif., Give Entertainment.—The employees of the steam generating department of the Southern California Edison Company, Long Beach, Calif., recently held an entertainment in the Chamber of Commerce auditorium. The program was opened by Helen Hineman of the Edison office in Montebello, who impersonated Busy Buttons, the company's little page-boy. G. Haven Bishop, the company's photographer, presented a two-reel comedy. Music and several specialties were furnished by the Shell Company orchestra, and the Shell quartet. Dancing was the chief diversion the latter part of the evening.

Electric Club to Continue Holding Meetings During Summer.—The Electric Club of Los Angeles has voted to continue holding weekly meetings during summer months without interruption. In previous years the club recessed during the three summer months.

Westinghouse Company Holds Annual Meeting.—At the annual meeting of the Westinghouse Electric & Manufacturing Company held recently at East Pittsburgh the following directors whose terms had expired were re-elected: F. A. Merrick, vice-president and general manager, Westinghouse Electric & Manufacturing Company; R. B. Mellon, president, the Mellon National Bank, Pittsburgh; George M. Verity, president, the American Rolling Mill Company, Middletown, Ohio; and Jerome J. Hanauer, of Kuhn, Loeb & Company, New York.

Personals

Nathan A. Bowers, associate editor of Engineering News-Record, has received the degree of Doctor of Philosophy from Stanford University. Particular significance attaches to the

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award in that this is the first time a civil engineer has received that degree from Stanford. Mr. Bowers submitted as part of the requirements a thesis on "Engineering Failures in the Water Power Field." Beginning with the reservoir and giving attention to dams, tunnels, penstocks, valves, control apparatus, hydraulic turbines and draft tubes, the scope of the study extends from point of diversion to tailrace. The subject chosen was particularly appropriate because during sixteen years of editorial work Mr. Bowers has specialized on hydroelectric developments and has had unusual opportunity to investigate personally accidents and breaks in that field. To this personal experience and to data secured at first hand from other engineers Mr. Bowers added much authentic data on failures gathered through an exhaustive review of English and foreign technical publications. An arrangement was made with Stanford University whereby the thesis will not be made public, thus making it possible to include much confidential data not heretofore released and assembled for collective study. Mr. Bowers joined the staff of Engineering News-Record in New York in 1910. Two years later he was transferred to Vancouver, B. C., to represent the paper editorially in the Pacific Northwest, and in 1914 was made Pacific Coast editor of McGraw-Hill publications with headquarters in San Francisco. As part of this assignment he served as Pacific Coast editor of Electrical World from 1914 to 1919. In addition to other duties, Mr. Bowers found time to be secretary-treasurer of the San Francisco Engineering Council for two years, and for about five years filled the same position in the local section of the American Society of Civil Engineers. He is now first vice-president of the San Francisco Engineers' Club. Mr. Bowers, a native of California, was graduated in civil engineering from Rose Polytechnic Institute, Terre Haute, Ind.

R. E. Cunningham, formerly operating electrical engineer, Southern California Edison Company, Los Angeles, has ended an association with that company that began in 1902 by resigning to go into business for himself. Mr. Cunningham has entered into partnership with **Charles Farnham,** who has been handling a number of lines of electrical equipment in Los Angeles for about twelve years, and the firm will be known as electrical and sales engineers.

Chester Coon, whose hot line tools made for use upon the lines of the San Joaquin Light & Power Corporation, Fresno, Calif., have aroused interest, has left the latter company to engage in the manufacture of "hot tap" tools at Oakland under the trade name of Safety Live Line Tool Company. Mr. Coon was a member of the San Joaquin company's organization for seven years, starting as lineman.

L. N. Robinson, of the engineering department of Stone & Webster, division of construction and engineering, lately left Seattle to enter the engineering section of that company's Boston organization. For the past three years Mr. Robinson has been engaged in the development of the Puget Sound Light & Power Company's Baker River project.

Sam G. Hepler, president, The Arrow Electric Company, Seattle, has been elected president of the Mutual Business Club of that city. Mr. Hepler is also a prominent member of the Electric Club of Seattle.

W. A. Knost, sales manager of appliance division, Illinois Electric Company, Los Angeles, not long ago paid a visit to San Francisco.

L. A. Nott, San Francisco manager for the Sangamo Electric Company, Springfield, Ill., visited the Northwest a short time ago.

E. L. Hughes, for several years assistant superintendent of the electric department, De Sabla division, Pacific Gas and Electric Company, has been transferred to the San Francisco general office where he will take up new duties in the electric construction and operating department. **W. G. Whitney,** formerly an office assistant in the department of electric construction and operation, has been appointed to succeed Mr. Hughes.

C. D. Weiss, superintendent of transportation and stores, San Diego Consolidated Gas & Electric Company, has been appointed a member of the executive committee of the San Diego Chapter, American Red Cross, for the ensuing year.

J. McA. Duncan, for fourteen years Pittsburgh district manager, Westinghouse Electric & Manufacturing Company, has been promoted to assistant general sales manager of that company. **W. R. Marshall,** formerly branch manager at Buffalo, succeeds Mr. Duncan. **Roscoe Seybold,** who has been manager of price statistics for the company, has been made assistant to **F. A. Merrick,** vice-president and general manager.

M. K. Pasco, sales manager, Armstrong Manufacturing Company, Huntington, W. Va., who has been making a tour of the West recently visited Los Angeles en route to the P.C.E.A. convention in that city.

J. D. Ross, superintendent of the Seattle Municipal Light Department, recently spoke before the American Association of Engineers on lighting, comparing the Seattle lighting system with that of Eastern cities which he recently visited.

George B. Sanford, formerly division manager at Sacramento, Calif., for the Great Western Power Company, San Francisco, has been appointed secretary and assistant treasurer of the Grays Harbor Railway & Light Company, Aberdeen, Wash., succeeding **A. B. Doerr,** resigned.

H. B. Sewell, district manager in Bellingham, Wash., for the Puget Sound Power & Light Company, recently returned from Boston, where he attended a convention of Stone & Webster managers.

W. A. Slater, engineer physicist of the Bureau of Standards, under whose supervision tests of the experimental arch dam built under the auspices of Engineering Foundation on Stevenson Creek, near Fresno, Calif., are being conducted, has been made chief of the division of concrete and masonry construction of the Bureau of Standards in Washington, D. C.

John B. Gray, who for many years has been chief clerk in the operating department of the Southern California Edison Company, has been transferred to the employment department of the company as assistant supervisor of employment.

John A. Laing, vice-president, **H. S. Gray,** attorney, and **H. H. Schoolfield,** chief engineer, Pacific Power & Light Company, Portland, recently visited Spokane to confer with officials of the Clearwater Timber Company and Northern Pacific Railway Company concerning the joint timber and power development on the Clearwater River at Lewiston, Idaho.

R. C. Mixer, for the past six years owner and operator of the Mixer Electric Company, Lodi, Calif., has rejoined the San Francisco organization of the General Electric Company, being affiliated with the merchandising department. Mr. Mixer formerly was associated with that office prior to engaging in business for himself.

E. R. Owen, in charge of the Logan division of the Utah Power & Light Company, Salt Lake City, was the principal speaker at a meeting of the Logan Kiwanis Club a short time ago.

W. J. Morris, purchasing agent, Portland Electric Power Company, and **A. W. Angell,** purchasing agent, Northwestern Electric Company, and **J. R. McCalm,** Fobes Supply Company, all of Portland, attended the annual convention of the National Association of Purchasing Agents, held in Los Angeles early in June. Mr. Morris is vice-president, and Mr. Angell a director of the national association.

J. R. King, telephone specialist of the Graybar Electric Company in Seattle, went to New York for the first nation-wide convention of the company's trade specialists that opened a four-day session in that city recently. This is the first conference of these specialists since the company was founded fifty-seven years ago.

E. H. Snissen, assistant vice-president of the Westinghouse Electric & Manufacturing Company, has been spending four weeks in the Los Angeles territory.

Sir Aubrey Brisco, electrical engineer, recently returned to San Francisco to make his residence after spending three years in England.

F. B. Kniskern, circuit breaker engineer, supply engineering department, and **J. Boden,** inspector, circuit breaker department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, recently spent considerable time at the Vaca-Dixon substation of the Pacific Gas and Electric Company conducting tests on the 220-kv. Westinghouse breakers installed at that point. In conjunction with these tests, **S. B. Griscom,** general engineering department; **C. F. Wagner,** insulator and transmission engineering department, and **O. B. French,** oscillograph operator, engineering laboratory, of the Westinghouse company's Pittsburgh organization, have been engaged in making some transmission stability tests on the 220-kv. transmission lines.

H. G. MacDonald, circuit breaker engineer, supply engineering department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, recently spent some time in Los Angeles in negotiation with the Southern California Edison Company and the Bureau of Power and Light regarding heavy-duty high-tension circuit breakers.

George L. Myers, assistant to the president; **H. H. Schoolfield,** chief engineer; **George C. Sawyer,** sales manager; **W. T. Neill,** superintendent of rates and service; **S. E. Skelley,** manager investment department, and **V. H. Moon,** appliance sales superintendent, were among those from the Portland office of the Pacific Power & Light Company who attended the convention of the Northwest Electric Light and Power Association at Spokane in June.

Dexter S. Kimball, dean of the college of engineering, Cornell University, while in attendance at the Spring Meeting of the A.S.M.E., in San Francisco, addressed the members of the San Francisco Electrical Development League on "An Engineer's Prophecy."

D. E. Harris, president, Pacific States Electric Company, San Francisco, is making an extensive Eastern trip.

A. C. McMicken, sales manager, Portland Electric Power Company; **Norwood W. Brockett,** manager public relations, Puget Sound Power & Light Company; **J. H. N. Adams,** advertising manager, Mountain States Power Company, Tacoma; **D. L. Scott,** manager public relations, Los Angeles Gas and Electric Corporation, and **H. K. Griffin,** commercial agent, Western States Gas & Electric Company, were among the utility men who attended the sessions of the Pacific Coast Advertising Clubs Association convention in San Francisco the early part of July.

Harrison Smitherum, assistant engineer of the California Division of Water Rights, has been appointed water master for Shasta Valley for 1926 by **Edward Hyatt, Jr.,** chief of the division. Mr. Smitherum was water master for Shasta Valley in 1924.

Dwight Ware of the Securities Company of the Puget Sound Power & Light Company, Seattle, recently returned from a convention of Stone & Webster managers at Norfolk, Va.

E. G. McCann, president of the San Francisco Electrical Development League, was a visitor to the Electric Club of Los Angeles recently while in that city.

Z. E. Merrill, assistant general manager, Mountain States Power Company, Albany, Ore., recently talked before the Commercial Club of Independence, Ore., on the proposed hyroelectric bill in Oregon and also discussed the use of electricity in Oregon agriculture.

Hylon T. Plumb, engineer of the Salt Lake City branch of the General Electric Company, has been given an honorary degree of bachelor of science by Milton College. Mr. Plumb delivered the commencement address at that institution.

D. C. Green, vice-president and general manager of the Utah Power & Light Company, Salt Lake City, has been elected a member of the board of governors of the Chamber of Commerce of that city.

C. E. Stewart, engineer of the General Electric Company of Schenectady, recently addressed the Engineers Club of Seattle on "Supervisory Systems for Control and Indication of Power Apparatus."

E. H. Lytle, of the British Columbia Electric Railway Company, Ltd., Vancouver, has been promoted to have charge of the company's information bureau, succeeding **A. E. Chamberlain,** who has left the company.

Donald B. Ocamb, formerly with the Pacific Telephone & Telegraph Company, San Francisco, has joined the Graybar Electric Company's organization as a telephone specialist. Mr. Ocamb succeeds **A. C. Brunner,** who has resigned to become affiliated with the Western Equipment Supply Company, Manila.

R. L. McLellan, managing director of the Cia Westinghouse Electric Internacional, S. A., of Argentine, recently has been elected president of the United States Chamber of Commerce of Argentine.

H. M. Towne, of the General Electric Company of Pittsfield, Mass., was a visitor to the Electric Club of Los Angeles not long ago as the guest of **J. H. Cunningham** of the General Electric Company of Los Angeles.

Ernest L. Dee, sales manager of the Edison Lamp Works of the General Electric Company in Salt Lake City, left recently to attend a meeting of the sales managers of the company in Harrison, N. J. From there he went to Association Island to attend the meeting of engineering, manufacturing and division sales managers of both the National and the Edison Lamp Works.

A. E. Vieu and **Ernest F. Granzow,** of the Crouse Hinds Company of Denver, and **George O. Hodgson** of the Edison Lamp Works of Denver, were in Salt Lake City not long ago on a business trip.

P. M. Parry and **George B. Thomas,** of the Utah Power & Light Company, were the representatives from Salt Lake City to the recent National Electric Light Association convention in Atlantic City.

George Rucker, Pacific Coast manager of the Holophane Company, paid a visit to Denver on his way east to the Holophane Company's plant at Newark, Ohio, for a recent sales conference.

C. V. Allen, formerly assistant treasurer, Westinghouse Electric International Company, has been promoted to the post of treasurer and assistant secretary, succeeding **H. A. Carmichael,** resigned.

E. A. Phinney, president and general manager, The Jefferson County Power & Light Company, Golden, Colo., will serve as general convention chairman of the combined conventions of the Rocky Mountain division of the National Electric Light Association and the Colorado Public Service Association to be held in Glenwood Springs, Colo., in September. This will be the third time that he has acted in that capacity, having been general chairman at both the 1924 and 1925 conventions. Mr. Phinney is very well

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known in the electrical industry in the Intermountain region and always has given freely of his time and energies in its activities. From 1905 until 1914 he was president and secretary of the Ouray Electric Power & Light Company, Ouray, Colo., from 1910 until 1914 president of the Ridgway Electric Company, and president of the Montrose Electric Light & Power Company and the Delta Electric Light Company from 1912 until 1914, when all four companies were sold to the Western Colorado Power Company. In 1915 he purchased the property of the Golden Illuminating Company, changing the name to The Jefferson County Power & Light Company, and has been president and general manager since that time. Mr. Phinney is an ex-president of the Rocky Mountain division of the N.E.L.A., having occupied that position for the 1920-1921 term.

R. M. Alvord, district manager for the General Electric Company in San Francisco, recently departed on a trip to Schenectady, N. Y., the head offices of the company.

Obituary

Charles E. Scribner, for twenty-three years chief engineer of the Western Electric Company, New York, and for six years prior to his retirement consulting engineer, died at Jericho, Vt., June 25. With the exception of Thomas A. Edison, whose life-long friend he was, Mr. Scribner was credited with holding more patents in the electrical field than any other inventor. The first multiple switchboards to be used commercially were of his design.

TRADE NOTES

Safety Live Line Tool Company, Inc., 223 Fifth Street, Oakland, Calif., is the name Chester Coon, for the past seven years a member of the San Joaquin Light & Power Corporation's organization, has given to the company he has formed to manufacture "hot tap" tools. These live line tools permit high-tension distribution lines to be worked "hot" with perfect safety to line crews, according to the company. Complete information or demonstration by a company representative will be furnished upon request.

The Hart & Hegeman Manufacturing Company, Hartford, Conn., has issued a new catalog which is just off the press. Many changes have been made in the book. List prices and standard package quantities have been brought up to date. The catalog shows the company's complete wiring device line as well as a line of new products added to its stock, among them fish switches, snap switches, canopy switches, adjustable candle sockets and canopy receptacles, combined tumbler switches and receptacles. The catalog is known as "S" and is now available to anyone upon request.

The Electric Controller & Manufacturing Company, Cleveland, O., has developed a completely self-contained, oil-immersed automatic starter for 2,300-volt synchronous motors. This is built for across-the-line starting of slow-speed motors and for reduced voltage starting of the higher-speed motors.

Warren Webster & Company, Camden, N. J., have established a branch office in Salt Lake City, Utah, to serve the requirements of their customers in Utah, southeastern Idaho and eastern Nevada. **Rushby C. Midgley** has been appointed district manager.

The Perfeclite Company, 422 Fourth Avenue, Seattle, has purchased through receiver's sale patents and other assets of the late Masters Fixture Company of Auburn, Wash. The Seattle concern has entered into an arrangement with a group of Auburn men, headed by **G. C. Lang,** to manufacture the electric light shades and other fixtures formerly made by the Auburn concern.

Hotchner Brothers, manufacturers of electric signs, have recently moved into their new home, corner Eighth and Howard Streets, San Francisco.

The Corning Glass Works, Corning, N. Y., has entered the electrical transmission field with high-tension Pyrex insulators. At present the company is offering pin-type insulators of a one-piece design for operating voltages from 6,600 to 50,000. Development work is proceeding on suspension and flange or stack-type units, and further announcements will be made later. **Raymond W. Lillie** is manager, with offices at 501 Fifth Avenue, New York City.

Packard Electric Company, Warren, Ohio, has appointed **A. J. Myers Company,** 611 Howard Street, San Francisco, exclusive agent for the state of California north of Fresno and the entire state of Nevada.

The Cecil R. Lambert Company, Inc., Detroit, specialists in the design, manufacture and installation of conveying and handling equipment, has changed the company name to **Mechanical Handling Systems, Inc.,** in order to identify its products and service with its name.

Wagner Electric Corporation, St. Louis, has issued bulletin No. 146 on Power-Factor Correction by the Consumer. This covers the experience of the American Gas & Electric Company of New York City.

Keeping it in the family, with a vengeance. The two people who know more about electric cooking than any others in the country perhaps decided to make it one. Now when Ray Turnbull, Pacific Coast sales manager of the Edison Electric Appliance Company, comes home from a round of golf he gets a home demonstration in electric cooking from Carol Dangler Turnbull, home economics specialist for the Edison Electric Appliance Company. News of the marriage of this supreme combination in electric cookery came as a suprise to friends of the couple at the recent Northwest Electric Light & Power Association convention in Spokane.

Pass & Seymour, Inc., Syracuse, N. Y., has developed a new porcelain ring receptacle with identified loop terminals. The maufacturer claims that it is necessary only to loop the wires under the ears of the terminal which then are bent down and solder applied. When this terminal is coated with the usual insulating wax or compound, it makes a reliable mechanical and electrical connection.

George Richard & Company, Chicago, have placed on the market a new bell-ringing transformer, which is designed for residences and small apartments. It is made to lie flat against the wall, which permits mounting in boxes, thereby saving considerable time in installation. The transformer is manufactured in both single-circuit secondary and three-circuit secondary. The single-circuit delivers 8 volts on the secondary side. The three-circuit secondary type delivers 6.12 and 18 volts, respectively, when installed.

The Chicago Flexible Shaft Company has appointed **B. A. Graham,** formerly its Western representative with offices in San Francisco, sales director of its appliance department with headquarters in Chicago. Mr. Graham will assume direct control over the sales of the company's electrical appliances and devote particular attention to the Sunbeam iron which it manufactures.

Tork Company, New York City, has issued a pocket booklet containing descriptions of the Tork clocks for controlling store window lights, electric signs, traffic signal lights, floodlights, street and park lights, apartment house hall lights; also for controlling automatic oil burners, buckwheat coal burners, alarm systems and advertising machines. Photographs and price lists are included in the booklet.

Farnham & Cunningham is a recently formed Los Angeles engineering firm. **R. E. Cunningham,** formerly connected with the Southern California Edison Company, Los Angeles, and **Charles Farnham,** who has been handling electrical equipment lines in Los Angeles for about twelve years, have entered into a partnership as electrical and sales engineers. The firm, whose address is 307 South Hill Street, Los Angeles, will represent Schweitzer & Conrad, Inc., G. & W. Electric Specialty Company, the McCormick Lumber Company and others.

Fred W. Williams, Santa Maria, Calif., has invented a fuse plug having six fuses in one base so that the necessity of making a replacement with an entirely new plug each time a fuse wire is burned out is eliminated. When a fuse wire burns, all that is necessary to place another fuse wire in the circuit is to turn the top of the fuse to the next position. The fuse has a mica face so that the particular fuse wire which is burned out may be seen at a glance as well as the number of wires left in a fuse.

Rollin Smith Engineering Company, Los Angeles, has opened an office in San Francisco at 519 New Call Building, 74 New Montgomery Street.

Pittsburgh Transformer Company, Pittsburgh, has issued bulletin No. 2055, on the Pittsburgh transformer tap changer, which consists of a switch mounted above the coils of the transformer and made a part of the terminal board. The construction and operation of the switch are illustrated in the folder.